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THE CONFLICT OF NATURALISM AND HUMANISM

BY

WILLYSTINE GOODSELL, Ph.D.

[TEACHERS COLLEGE] COLUMBIA UNIVERSITY
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PREFACE

The author is deeply conscious of the incompleteness of this study in view of the vast range of the subject. But if it may serve to stimulate a few minds to intelligent consideration of a large and important problem in our present-day thought it will have fulfilled its purpose.

My grateful acknowledgments are due to Professor John Dewey, whose vigorous thought has vivified and reshaped my entire philosophy of nature and of man. Likewise I gladly acknowledge my indebtedness to Professor John Angus MacVannel, whose instruction first stimulated my interest in the living problems of philosophy; and to Professor Paul Monroe whose ideals of careful scholarship I have attempted to follow in the preparation of this study.

W. G.

Columbia University,
April 1st, 1910.

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THE CONFLICT OF NATURALISM AND HUMANISM

INTRODUCTION

When the unceasing flux of natural forces has generated reflective beings, nature becomes self-evaluating and critical of the meanings she has heretofore blindly evolved. This reflective power, focussed in man, confers upon him the office of maintaining and multiplying the meanings which nature suggests, and of organizing these, so far as may be, into an ordered realm of values. To this colossal task,—nothing less than the construction of a significant world, responsive to the needs and purposes of its builders,—mankind have bent their energies with increasing self-consciousness. That the work should have pushed forward steadily and in one direction could hardly have been anticipated. A multiplicity of obscure natural causes have operated from the beginning to determine each man's attitude toward the world of nature, of institutions and of ideals into which he is gradually initiated from his birth. Regarded as the conflict of reason with mere brute existence and change, human history reveals periods of intense activity and progress in the transmutation of physical energies into spiritual values, followed by epochs of comparative intellectual torpor.

But through the myriad changes and variations in the life of thought, three dominating attitudes may be traced with some definiteness. The first, which may be called the supernatural, attempts to explain all material and spiritual phenomena by reference to tremendous unseen personalities, or to a great First Cause, distinct from man and nature, and more or less directly responsible for their countless manifestations. This world-view, rooted deep in human nature, has its ardent adherents in every period. From the age of the Homeric myths to the times of religious upheaval that brought forth the stern theology of Calvin, the upholders of supernaturalism have outpoured their faiths and fears in literature. This attitude, having its well-spring in man's

attempt to read back his own emotions, first into natural objects and then into unseen agencies, shows little evidence of relaxing its grasp on his intellectual and emotional life.

Not antagonistic to the supernatural, yet by no means always in accord with it, is the humanistic attitude, which seeks the key to the riddle of the universe in the existence of man. Human life with its needs, its ideals, its possibilities of achievement, is the rudder by which the cosmic ship is steered, and the betterment of this life is the supreme goal "to which the whole creation moves." Thus the significance and worth of the universe rest in their relation to the life of man, the touchstone of all value. Such conceptions of the meaning of the world incline not rarely toward the supernatural attitude. If the cosmos reveals beneficent design working toward the ultimate apotheosis of man, such a rational and kindly order must presuppose some gracious Spirit of Reason working at the heart of things. Although the philosophy of humanism, from Plato to Kant and Hegel, may take stubborn issue against certain tenets of the theology of supernaturalism, the two are not of necessity opposed and indeed may not infrequently be found in amicable coöperation.

The last of the three world-attitudes mentioned above is that of naturalism,—~~the attempt to explain human life, as well as all phenomena that penetrate man's experience, by reference to natural forces, operating throughout the universe to produce unvarying sequences of events.~~ Such a *Weltanschauung* firmly relegates to the sphere of hypothesis all assumptions of whatever sort that can neither be proved by logical necessity nor confirmed by experience as growing inevitably out of the facts and leading to favorable reactions upon them. In the world-scheme of the naturalist, ~~human life finds its place as a modification of the same physical energies that hurled suns and planets into their courses and produced an ordered world from a primeval chaos.~~ Needless to say, such a view does not lend itself to the exaltation of man as lord of the universe. The inspiring words of the Psalmist,—“The heaven, even the heavens are the Lord's; but the earth hath he given to the children of men,”¹ find little response in the mind of him who has come to regard nature as a vast and delicately intricate mechanism whose blind forces can

¹ Psalms, CXV, 16.

be directed into channels useful to humanity only by painstaking discovery and control of its modes of operation. Thus man is only one of the countless offspring of an ever-pregnant Nature and it cannot be confidently asserted that he is a specially favored son. Consciousness, from this view-point, is a somewhat impertinently intrusive phenomenon, difficult of explanation and quite possibly transient in nature. Absorbed in facts and the problems and verifiable hypotheses suggested by them, the naturalist has little time or sympathy to expend in the humanist's task of unravelling the history of human ideals, with its record of failure no less than of achievement. *Cui bono?* Since man has sprung from the womb of nature and will return thither, how can he more profitably engage his energies than in understanding and controlling those material forces which produced him and which may be made to ameliorate the hard conditions of his existence?

Nor has naturalism developed more fraternal relations with supernaturalism than with humanism. The history of the conflict of science with religion reveals a marked divergence of attitude in these hostile camps. On one side is man's quenchless yearning for a supreme ideal, cramped within the binding folds of a dogmatic theology, yet still vital and eager and asserting an inalienable right to interpret the universe in consonance with its deepest emotions. Opposed to this is man's devotion to truth as revealed to rational intelligence in the facts of experience,—a calm, critical spirit of analysis and synthesis, yet one capable of vast enthusiasms and loyalties. The former attitude, embodied in the great institution of the Church, constituted itself the resolute aggressor against naturalism, until the latter, gaining strength and cogency, in turn assumed the offensive and pushed its ancient foe so shrewdly that an armed truce was the outcome. At present each pursues its goal with little strenuous opposition from the other,—the one ministering to emotional and the other to intellectual craving. Indeed it is by no means uncommon to find men who are adherents of both world-views at once,—men who, like Pierre Gassendi, rest content with a complete dualism in their philosophy and their religion.

Thus the *status quo*, far from being an organic synthesis of three world-attitudes, each rooted deep in human nature, reveals a condition of marked cleavage, with rather dubiously successful attempts, here and there, to throw temporary bridges across the

chasm and thus secure an appearance of unity. But the division in thought lives on and reveals itself not alone in science, philosophy and religion but in current social theory and in education. In his creed of social regeneration the humanist makes much of the remedial influence of education and moral training, while the naturalist preaches the overthrow by science of those conditions of extreme poverty and misery which furnish direct incentives to social and moral degradation. While the humanist turns his eyes lovingly toward the past and urges the rich study of human aspiration, struggle and achievement as the supreme means of education, the naturalist points with pardonable pride to the mastery and redirection of physical forces wrought by modern science. This conquest, he urges, was made possible by patient investigation of present-day problems and facts and, however partial it may be, has already vastly improved the conditions of human life. The humanist tends to the belief that coming generations may be made wise and efficient through much contemplation of the youth of the race. The naturalist, on the other hand, not understanding the vital relation of ideal and fact which the Book of the Past so vividly sets forth, would throw aside this record and immerse the student in the immediacy of the present. Thus the one fails to see that ideals are vital only when born of present needs or ministering to them; the other is blind to the truth that the very facts to which he binds his faith are dependent for their discovery upon those ideals that he ignores.

To the student of the development of human thought this divergence in world-attitudes is early apparent and bears witness to the antiquity of the problem. With the growth of reflective life among the Greek people, these positions emerge and receive clear definition. At first Greek philosophy is directed outward, and, stimulated to reflection by the flux of things, it seeks to reduce all change and qualitative difference to one underlying *Welt-stoff*. The Ionian school bequeathed to its successors a logical physics which yet maintained its hold upon experience in that it sought for the fundamental substance in elements familiar to all. In this early Ionian philosophy a humanistic note was clearly sounded. The universe was regarded as a perfect realization of that balance and justice which human society so incompletely set forth. Thus the cosmic order was at first conceived

as ethical in purpose. But in their notion of a world-substance the Ionians suggested the two antithetic conceptions of never-changing substance and of self-initiated changes. These opposing views gave rise to the schools of Parmenides and Herakleitos in which the changeless Being of the one is set over against the ceaseless flux of the other,—eternal Substance² against eternal Becoming in accordance with a definite order.³

But the failure of these metaphysical speculations adequately to explain the daily and yearly phenomena of nature gave rise to those systems of Empedocles, Anaxagoras and Leucippus which, while preserving the notion of the eternal, homogeneous nature of true Being, sought to explain qualitative change by shattering the universe into elements and introducing some dynamic principle to force them together. In the systems of Empedocles and Anaxagoras this motive power was anthropomorphic in character,—in the former being the dual strife of love and hate,⁴ in the latter a species of animate and tenuous soul-stuff, self-moved and guiding all cosmic motion in accordance with rational ends.⁵ But with Leucippus all trace of humanism disappeared and a mechanical theory of the universe was for the first time elaborated. While retaining the absolute, unchangeable Being of the Eleatics, Leucippus broke this up into countless atoms, inhabiting infinite space and causing by their blind, self-initiated movements, which brought them into contact, the formation of worlds and of objects. Hence all change was due to the mechanical movements and collision of atoms in space, and the principle of mechanism, barely suggested by his predecessors, was by Leucippus clearly enunciated.

Thus early Greek philosophy was strongly materialistic and culminated with Leucippus and Democritus in a naturalistic explanation of the universe from which the humanistic conceptions of teleology and spiritual dynamics were rigidly excluded. The initial step in this development was made when a vague conception of nature was drawn from crude experience as its first differentiation. But this notion was so saturated with human

² Cf. Parmenides, *Fragments*, 35-105. Trans. by Fairbanks, *Early Philosophers of Greece*, pp. 89-97.

³ Cf. Herakleitos. *Fr.*, 20-25, *Fr.*, 46, 68, pp. 29, 30.

⁴ Cf. *Fragments*, 33-209, *op. cit.* pp. 161-183.

⁵ *Fragments*, 1-18, pp. 237-245.

feeling and sentiency that only very gradually could nature be stripped of extraneous and irrelevant accompaniments and its machinery laid bare. That Greek thought advanced so rapidly from supernatural and humanistic world-views to a mechanical conception of nature furnishes but one more illustration of its remarkable vigor and fertility.

But a metaphysical physics, however daring in its hypotheses and cogent in its reasonings, could not permanently nourish the intellectual cravings and practical needs of so reflective a people as the Greeks. It was ill prepared to furnish satisfactory explanations of the pressing questions suggested by their broadening experience. In the national awakening following hard upon the Persian invasions, the Greeks were confronted with urgent political and ethical problems that cried aloud for solution. The old reverence for custom and precedent was undermined by a spirit of criticism which smote at the very roots of ancient institutions, and by the ardent desire for independent reflection and useful innovation. The demand was made upon philosophy to come forth from its isolation and demonstrate its practical worth in the agora of public life. Social disintegration and social unrest gave birth to a new philosophy in which human life, human good and the problem of human knowledge became matters of supreme interest. The conception of nature, first offspring of reflective and practical experience, gave place to a conception of self and of mind, hitherto only vaguely defined. Greek philosophy became subjective and practical and concerned itself for the first time with the essentially human questions of moral and political well-being. In their train followed pressing problems regarding the constitution of human nature, the origin of moral ideals and the universal validity of knowledge.

Thus out of human need, with its demand upon rational intelligence, Greek humanistic philosophy came into being. With the sophists Hippias and Prodicus, however, this humanism is largely tinctured with the earlier naturalism. In their philosophic teaching the first clear distinction is made between nature on the one hand and law on the other.* The former is regarded as changeless and eternal in its operations while the latter is held

* Cf. Benn, *The Philosophy of Greece*, pp. 136-138; also *The Greek Philosophers*, I, p. 80 ff.

to be the product of *Nomos* or Convention and thus is conceived as varying with the moods and circumstances of men. All moral ideals must find a firm support and justification in the supposed purposes of a fixed natural order which is not infrequently totally opposed to human law and convention. Likewise the natural disposition of every individual, being part of this immutable order of nature, must be conceded the right to develop according to its own laws. Virtue is the precious gift of nature and may not be imparted by education. Thus the highest moral law is not that prescribed by custom or convention but rather that which individual feeling and impulse, unfolding in accordance with natural necessity, set up for themselves as right and desirable.

Opposed to the naturalistic bent of Hippias is the advanced humanism of Protagoras. Scorning the nature philosophy of his fellow-sophist with its emphasis upon physics and astronomy, Protagoras preaches the doctrine of the relativity of all knowledge and all moral standards to human interest and need. Virtue and justice in his conception are no absolute things but rather are wholly creatures of human convention, varying with the mutable conditions of social living. The famous dictum of Protagoras that "Man is the measure of all things" should probably not be interpreted as a sanction for pure individualism. That the theory of knowledge maintained by this famous sophist, affirming, as it did, a crude sensationalism as the fountain-head of knowledge, readily lent itself to scepticism regarding a universally valid science cannot be denied or ignored. But if the saying of Protagoras be considered in relation to the controversy between nature and convention so keenly debated in his time, his meaning becomes clear. Man must fix his own standard of values with regard to what he deems his highest interest; but this "measure" is no fixed limit. Rather is it a movable standard, advancing with man, its creator, who can thus realize fresh possibilities of existence by the exercise of his own powers. Hence the study of human conduct in all its aspects and implications was lifted by Protagoras into a position of commanding importance and was conceived as alone worthy of the attention of philosopher and youth.

Thus the Greek sophists sketched in bold outlines the great antithesis of their own and future ages,—nature *versus* convention, naturalism *versus* humanism, the craving for a fixed natural order over against the ideal of a progressive re-shaping of truth in the

interest of human need and by the agency of human intelligence. The world-attitudes of Hippias and Protagoras, having given birth to the rival systems of Cynic and Cyrenaic, Stoic and Epicurean, disappeared in the Middle Ages only to assert themselves with renewed vigor amid the seething interests of the Renaissance, and later, with sharpened definiteness, in the France of Voltaire and Rousseau.

But the sincerity which undoubtedly marked the search of the earlier sophists after an ethical source and standard was lacking in the work of their successors. Both schools became infected by the corruption and selfishness of their age. The conception of natural right degenerated into the doctrine that right is the interest of the stronger, and the humanistic creed led to the denial of all general truth or objective reality. In the midst of a widespread social and moral disintegration, the three master-minds of Greece strove in vain to construct a philosophy of human life which should meet the urgent needs of their countrymen and arrest the tide of decay which threatened to sweep away the ancient institutions.

In the teaching of Socrates the humanistic strain is clearly dominant. Caring not at all for the cosmological speculations of previous philosophers, he concentrates all his thought upon the solution of the moral and social problems suggested by the unsettled condition of the Athenian state. How shall individual reason and interest be given free play without endangering those general standards of virtue and justice upon which society is grounded? This led to the correlative problem: How discover a method by which mankind may attain to a standard of judgment of good and evil? The answer of Socrates is embodied in his oft-quoted sayings: "Knowledge is virtue," and "An unexamined life is one not fit to be led by man." In the first statement may be detected that craving of the Greek mind for a unifying principle which underlay the speculations of the earlier naturalistic philosophers. By a comparison of various arts Socrates found knowledge to lie at the root of each. The potter knows most about vases and bowls because he knows their *use* and can skillfully adapt the crude clay to serve a purpose. Here is clearly a tendency to regard the function of a thing as the standard of knowledge. Knowledge, then, is concerned with the use or the functions of man and things. The good man is he who performs

certain acts which constitute his peculiar excellence or virtue. Knowledge of the good was to restore the broken harmony between the individual and custom, as embodied in the institutions and ideals of the Greek state, and was to furnish both the criterion and the means of virtue. Believing, as he did, that reason is synthetic in its activity, uniting men in closer coöperation by its control of purely individual passion and desire, Socrates earnestly sought a method of attaining knowledge through the exercise of a rational power common to all men. The determination of the worths and values of life, and the method of attaining to clear conception of these, superseded all investigation of natural phenomena in the work of Socrates. Indeed, in his opinion, all scientific knowledge of nature was of doubtful validity and the attempt to attain unto it a misuse of powers that might better be exercised in the problems of human life. Thus Socrates added the force of his teaching to the tendency of the age to separate the interests of man from the course of nature.

In Plato is revealed the catholic mind which sought to mediate between the humanism of Protagoras and Socrates and the naturalism of Hippias and the physical philosophers. Profoundly concerned, in his earlier years, with the problem of the possibility and source of universally valid knowledge, Plato undertook that analysis of the soul which led him to reject empirical knowledge, as based upon the shifting nature of sense perception. For such uncertain knowledge he substituted the general conceptions framed by reason. Sense phenomena illustrate the principle of the Heracleitean flux, and all knowledge growing out of sense experience is a mixture of being and unreality—mere opinion. Truth lies within the soul, not without; in universal concepts, not in the perceptions of sense.⁷ Thus Plato creates a dualism between empirical and rational knowledge which is paralleled by the dualism between sense and reason.⁸

Thus far Plato and Socrates are in accord. But the disciple, unlike his master, cannot remain content with a conception of the Good which is confined within the domain of morals. What is the origin and what the validity and worth of those concepts of measure and order, beauty and justice, with which the soul of man is endowed? Must not the philosopher—this seeker after

⁷ Theaetetus (Jowett ed.), pp. 330-334.

⁸ Republic, V, (Jowett ed.), pp. 361-366.

the Good—pass beyond the sphere of the human and subjective and, by the light of the soul, discover that objective and eternal order which is both the source and the condition of all good? Human good cannot be conceived apart from an eternal, immutable system of existent goods in which it has its place; and the human soul must likewise be viewed in its relation to the order of nature.⁹ Thus Plato's passion for reason and order lead him into those cosmological speculations which constitute the groundwork of his philosophy. As there are degrees of knowledge, ranging from mere opinion to ultimate philosophy, so there are grades of being, from the void, or non-being, through matter in process of coming-to-be, to those ideal principles which exist eternal and unchanged. The soul, the source of movement, mediates between these highest forms of being and those partial realities, represented by natural phenomena, which are in continual flux. Highest of all in the hierarchy of true Being is the Idea of the Good, which, although transcending both existence and knowledge, is yet their ultimate cause.¹⁰ Thus Socrates' conception of virtue, or the good, was taken out of the sphere of morals where alone it was applicable, and was carried over into an ontological realm where it served as a unifying bond between reality and thought.

In Plato, then, philosophy reveals a tendency to turn from man to nature, or rather to work back from the constitution of the human soul to the ultimate nature of the cosmos. Man's highest good can only be discerned when he is conceived as part of a rational order; his purpose or end is unintelligible apart from the general purpose of the cosmos. Indeed there can be no doubt that Plato regarded the cosmological mode of approach to the problems of human life and destiny as the higher method. In the "Phaedo"¹¹ he clearly states that such a method of attaining to knowledge of the operations of Reason in the universe was attempted and cast aside as unsatisfactory in its results. But it should be remembered that Plato unhesitatingly expressed his opinion that the subjective mode of approach to philosophy was a secondary method to be employed only when the cosmological method had failed.

⁹ *Phædrus* (Jowett ed.), pp. 148, 149.

¹⁰ *Republic*, Bk. VI, pp. 395-399.

¹¹ Cf. *Phaedo*, (Jowett ed.), I, p. 475.

The tendency to seek for a purely human good in that of an all-embracing whole, apparent enough in the "Republic," is the dominant motive in Plato's latest work, the "Laws." Here he discusses the source of movement in the universe and by a course of reasoning seeks to prove that all motion externally originated must ultimately end in that of a "self-moved mover." But the only instance of such movement known to man is the human soul. The argument leads to the conclusion that the sun, moon and the sphere of the fixed stars are moved by souls, themselves endowed with dynamic power by the supreme Mind. In the words of Plato: "If, my friend, we say that the whole path of heaven, and the movement of all that is therein, is by nature akin to the movement and revolution and calculation of mind, and proceeds by kindred laws, then, as is plain, we must say that the best soul takes care of the world and guides it along the good path."¹² This supreme spirit, the ruler of the universe, has, in the theory of Plato, "ordered all things with a view to the preservation and perfection of the whole. . . . And one of these portions of the universe is thine own, stubborn man, which, however little, has the whole in view; . . . and you are created for the sake of the whole and not the whole for the sake of you."¹³

Between this objective order and the human sphere of morals and politics the organized State acts as mediator. The State is the image of that ordered whole which reflects the rational purpose of the supreme Mind. Hence, only in a State organized in harmony with a unifying purpose, which is part of a larger cosmic end, can the individual soul grow akin to the divine.

Thus the supreme idealist of Greece turns his back upon physical science, as representing the lowest grade of opinion, and formulates a theory of the universe based upon pure dialectic. His humanistic interest in the problem of moral good forces him to construct a theological cosmology which, not infrequently, seems crude and uninspiring.¹⁴ Here all the powers of supernaturalism are invoked to combat the mechanical theory of causation elaborated by the atomists.

The philosophy of Aristotle represents the supreme effort of Greek thought to transcend the dualism of man and nature, form

¹² Cf. *Laws* (Jowett ed.) Bk. X, p. 467.

¹³ *Ibid.*, p. 475.

¹⁴ Cf. *Timaeus* (Jowett ed.), p. 612 et seq.

and matter. Although Aristotle is commonly regarded as a scientific naturalist, emphasizing observation and exact knowledge, yet his writings are animated by the same passion for rational speculation that flamed in the nature of Plato, while they clearly lack the pragmatic tendency that marked the work of his master. To observe, to draw conclusions from these observations, and to mount from general truths to a consideration of the most universal and abstract principles demonstrable by reason was Aristotle's unvarying method. Hence his theories are less the fruit of a profound ethical and human interest than the outcome of a deep-rooted predilection for organized knowledge.

Yet there can be no intelligent study of Aristotle which does not recognize at the outset that the concept of 'end' dominates all his thought; and this notion is fundamental in ethics. True to his conception of definition, Aristotle held that any attempt to define the moral 'end' must be an attempt to subsume it under the genus 'end' of which it is a species marked with a peculiar character. Now the genus in this instance can be none other than the 'end' of the cosmos itself. Thus Aristotle transfers a moral concept, applicable in the sphere of human conduct, into the universe of Being and builds his metaphysics upon it.

A similar humanistic bias appears in his approach to the discussion of metaphysics. In the first chapter he analyzes the idea of art and discovers that "an art comes into being when, out of many conceptions of experience, one universal opinion is evolved with respect to individual cases."¹⁵ Knowledge and understanding pertain to art rather than to experience; thus "we reckon artists more wise than the experienced" because they are "acquainted with the wherefore and the cause."¹⁶ Such knowledge alone is scientific. With true Greek scorn for the merely useful, Aristotle conceives those sciences not designed for bare utility as highest in the scale of values, since they are not regarded as a means to ends beyond themselves. Hence the noblest wisdom is "conversant about first causes and principles." Now "it is manifest," continues Aristotle, "that one ought to be in possession of a science of primary causes (for then we say that we know each individual thing when we think that we are acquainted with the

¹⁵ *Metaphysics*, McMahon trans., I, 1, 35.

¹⁶ *Ibid.*, §8.

first cause); . . ."¹⁷ By such a train of reasoning, Aristotle is led to consider the concept of "cause" in the universe; and once more he falls back upon human arts for the explication of this idea. Every art has manifestly its own subject matter and its own end. This end is accomplished because some agent, guided by an ideal or an actual model, achieves his purpose in shaping the crude material to his idea. Thus in every human art are involved the material, the efficient, the formal and the final causes. Why, then, in the greatest and most complex of all arts—the art of nature itself—should not these same causes stand clearly revealed? To be sure the efficient cause in nature is in the process itself, whereas in art it is lodged in the agent. But with this distinction duly noted, the parallel holds good throughout.

But the foregoing is only the propaedeutic to a more complete implication of human concepts and values in the succession of material events. In the "Metaphysics" the whole scheme of human standards is carried over into nature and the multiform factors of the cosmic process are stamped as lower and higher, better and worse according as they reveal a greater or less degree of unchanging uniformity in the performance of function. As a close student of organic life, Aristotle was profoundly impressed by the fact that each living thing tends to realize its perfect and universal type. Through progressive stages of growth the species and the genus are evolved; the acorn becomes the scrubby bush, the bush the sapling and this in turn the full-grown oak-tree, maintaining its perfection by an ordered performance of the functions peculiar to itself. On the animal plane the same holds true; the fertilized egg produces the chick which by the immanent tendency of its own nature will develop into the hen—the completed type. Highest in the scale of organic life is man. Like the lower animals, his body attains its completion through successive stages; but into his nature is introduced a new principle which determines his peculiar excellence. Not the functions of mere nutriment, not those of desire and passion, but those concerned with reason are his distinctive endowment. Yet, even here, are grades of activity with their concomitant values. That life which consists in the regulation of passion and appetite by the practical reason is good and its highest realization is the life of the statesman. But nobler than this is that exercise of reason

¹⁷ *Metaphysics*, chap. III, § 10.

which has no end beyond itself. There "must be war for the sake of peace, business for the sake of leisure, things useful and necessary for the sake of things honorable."¹⁸ It follows that the activity of the practical reason exists for the sake of that rational activity which is a supreme human good in itself.¹⁹ Now since man alone among the higher animals is the possessor of reason and thus must be regarded as the noblest product of nature, his peculiar excellence and functions must be shared by the universe itself. Stage by stage the grades of Being in this earthly sphere mount from the inorganic to the organic, each with its complete 'end.' Then the earth, exemplifying the maximum of matter and 'accident' and the minimum of pure form is left behind, and there succeed the spheres of the moon, the sun, the planets and the fixed stars. Highest and outermost is the *primum mobile* which moves with immense velocity, because of "the fervent longing of all its parts" to be united with the quiet Empyrean where God dwells.²⁰ In this calm summit of the universe, the Deity as pure form is engaged in ceaseless contemplation of its own thought processes. Thus the universe reveals an immanent teleology, an eternal process of realization of ends, till the end in itself,—the activity of pure reason,—is reached. This is both the logical and the objective culmination of the whole hierarchical scheme.

Within this universal system man exists as a microcosm. His body is composed of cosmic elements obeying the law of their own development and constituting the possibility of the lowest form of soul life. The vegetative soul, an entelechy from one view-point, becomes the potentiality of the desiring soul, which is, in turn, not only an 'end' but likewise the potentiality of the practical reason. This, in its turn, exercises functions which are not an end in themselves but a means to the activity of the speculative reason—the supreme entelechy of man. In Book X of the "Metaphysics," Aristotle warms to eloquence when he describes the joys of the life of pure contemplation which links the mind of man with the Divine Reason. "So then," he exclaims, "the energy of the gods, eminent in blessedness, will be one apt for contemplative

¹⁸ Politics, Jowett ed., ch. 14.

¹⁹ Ibid.

²⁰ Cf. Dante's Banquet, Book II, ch. IV.

speculation; and of all human energies that will have the greatest capacity for happiness which is nearest akin to this."

Thus Aristotle constructs a noble philosophy upon the concepts of 'order,' 'function,' 'end' and 'good' that he has abstracted from human experience. Keeping them steadily before his inward vision, he approaches nature, and behold! he finds their objective realization in organic life and in the unchanging movement of the heavenly spheres. The difficulties inherent in his teleological scheme he bravely faces and attempts to explain. But the contradiction involved in his fundamental notion of any developing thing as both an 'end' with a fixed character and at the same time the indeterminate potentiality of a higher completion he never clearly conceives. Moreover, by transferring human preferences and evaluations into the sphere of material events, he is led to isolate one factor of a sequential process and stamp it with a peculiar worth. By what valid logic may the oak-tree be chosen as the perfection of the growth cycle of acorn—sapling—tree—acorn, etc.? That the healthy seed or the young sapling might as correctly be regarded as the end of the cyclic process appears reasonable enough. But the fact of culmination seemed to Aristotle as crystal clear. His insight failed to guide him to the pregnant truth that the true culmination is in human appreciation, which belongs in a subjective sphere, by no means to be confounded with the objective and material. Long centuries must pass away before scientific investigation forces upon the intelligence of man the conviction that the world of meanings and worths, although clearly implicated in the world of nature, cannot be carried over bodily into it. Man must find some other solution of the riddle of his relation to the material world if he would preserve knowledge from ultimate confusion and disaster.

In the thought systems of both Plato and Aristotle the problem of human knowledge and human good is viewed from an ontological standpoint. A hierarchy of being, ascending to the Absolute, corresponds to a hierarchy of knowledge, leading to perfect truth and goodness. The intimate interaction of man and nature, of reason and sense, in the upbuilding of a mutable and developing system of truth and of values is not even dimly apprehended by the Greek philosophers. In the system of Epicurus the pendulum swings back to naturalism. Matter is well-nigh apotheosized as the universal substratum; and thought is

reduced to the humble position of a mere accident of things. The universe in all its manifestations is the product of the chance movement of indestructible atoms. But the humanistic note is clearly sounded when Epicurus calls upon natural science to serve human needs, and proclaims that the sole value of knowledge is in relation to action. Therefore the supreme purpose of philosophy should be to introduce tranquillity and happiness into human life.

This pragmatic view of knowledge is likewise maintained by the Stoics, who pursue science solely for the sake of human well-being. Logic, metaphysics and the sciences have no value in Stoic philosophy save as an introduction to the study of human conduct. The previous dualism of thought and things gives way to a realistic monism. Mind and body are but two aspects of one reality and are revealed in the Supreme Being, who is identified with the universe. As the soul of the world, God governs the destinies of mankind and desires their good with providential love. Thus supernaturalism and humanism are blended in the Stoic philosophy, and the riddle of the course of nature in its relation to the life of man is passed on to the Middle Ages unsolved.

After the decay of the civilizations of Greece and Rome, their philosophy in modified form was taken up into the life of the Middle Ages and constituted the bone and sinew of Christian theology and Roman law. But this was a period of action, of control of unruly hordes by authoritative dogma. The problem of man's relation to nature, of thought to things, inevitably sank out of sight in the awful struggle of organized civilization with undisciplined barbarism. But when the ideals of law and of supernatural control had done their work, when the Germanic races had assimilated what was set before them of the ancient civilization, there appeared the dawn of a new order. The sense of individual power and worth was born again and the lure of unknown fields of knowledge and experience impelled mankind toward a truer comprehension of nature and of human ends.

In this brief survey, the antiquity of the problems suggested by naturalism and humanism has been indicated. Clearly outlined by the Greeks, these two world-views asserted themselves again and again in pagan philosophic systems and stimulated a perpetual conflict of ideals. It is the purpose of the present work (1) to describe the re-emergence of these ancient world-attitudes during

the intellectual ferment of the Renaissance, their more clear definition in the seventeenth and eighteenth centuries and their conscious opposition in the nineteenth; (2) to trace the profound influence of this opposition upon educational theory and practice in different periods; (3) to attempt a reconciliation of the views of naturalist and humanist upon the basis of the theory of pragmatism; and (4) to suggest the implications of such a synthesis for the philosophy and art of education.

CHAPTER I

HUMANISM AND NATURALISM IN THE RENAISSANCE

By the dawn of the fifteenth century the intellect of Europe had lifted itself above the levelling floods of conformity which had threatened to submerge it. Filled with a new and lusty life, it threw off the swaddling bands, so long confining its growth, and surveyed the world with a naïve wonder and a boundless enthusiasm. The knell of the old order, that sought to confine the theoretical spirit and its vitalizing discoveries and insights within the boundaries marked off by dogmatic theology, was sounded with increasing volume and insistence. Speculation had trod and retrod the same well worn paths and had gleaned no fresh truth in her wanderings. First in Italy and later in transalpine countries the barbarian mind had assimilated its frugal meal of pagan culture, thoroughly seasoned as it was with the salt of Christian dogma. Rendered vigorous and self-reliant thereby, it asserted its capacity to partake of a richer banquet,—to enter into the priceless heritage of Greek and Roman thought. In the realm of the intellect, as in religion and government, a world-rule was no longer possible.

But the enfranchisement of the spirit cannot be the work of a day. There must ensue a period of tutelage during which the mind of Europe sits in fervent admiration at the feet of its pagan masters,—hears, accepts, appreciates, and finally speculates for itself. The problems of nature and of man present themselves with fresh insistence and tempt all thoughtful minds to labor in their solution. But to the conflict are brought all those human preconceptions and preferences which are to clog the progress of scientific research for many centuries. The world of nature is not clearly delimited, for purposes of investigation, from the world of human affairs; rather are the two regarded as inseparable. Thus it comes about that the rediscovery of the external world

and of man proceed together, each acting and reacting upon the other. Nor, since philosophy had so long been conceived as a theory of human life and its ends, is it at all surprising that the earliest systems of natural science should wear the garb of humanism and clearly betray their human origin by their abstractness and absorption in questions of end and value. Nothing is easier and more inviting than idealistic speculation which is, in truth, the first offspring of man's reason. To the undisciplined mind the austerity and limitations of science are alien and uninviting. From its accumulated treasure of meanings and values, thought builds a fair, ideal structure which it elects to regard as representative of the external universe. This is a widespread human tendency and, during the Renaissance, it was reinforced by the mighty example of classic cosmology. Plato hypostatizes the meanings reason has wrested from experience; Aristotle reads the teleology of human arts into the mechanism of nature.

In the ferment of ideas which marks the age, Neo-Platonic conceptions of the universe struggle for supremacy with those of a purified Aristotelianism as championed by Pomponazzi. The Platonic Academy, established in Florence in 1440, has a brief but illustrious history and exerts a profound influence upon the nature philosophy of the period. Although it enthusiastically avows its allegiance to the teachings of Plato, yet the master's thought is draped in the mysticism of Plotinus. In the speculations of Bruno, Boehme and Paracelsus are the same fundamental world-views:—the universe is a revelation of an all-pervading spirit which is the unifying principle underlying the varied phenomena of nature. All apparent imperfections and contradictions disappear in the harmony of the All-One who unfolds His nature with beauty and purpose in the world. Thus the essence of the cosmos is made one with the essence of God and a pantheistic philosophy has possession of the domain of natural science.

But the essential humanism of these early Platonists not only underlies their cosmology but is the animating motive of all their eager search for knowledge. From their human vantage-ground, the questions of supreme import are the true nature of man and his rightful place in the universe. In varied forms appears the Aristotelian doctrine of man as a micro-

cosm, and this view colors all metaphysical speculation. In man as body, mind and spirit is gathered up the essence of all the material and spiritual elements of the cosmos. Like can only be known by like. Therefore man may pierce the secrets of the universe only because his body represents the sum of all material substances and forces; he may know the operations and forms of the world of intelligence only because he shares in its essential nature; and he may slip the sheath of sense and mount to the realm of pure spirit only because his soul is a spark of the divine fire. With Campanella humanism is manifest in the doctrine that man can truly know only himself. All knowledge of the external world is gained through the medium of sense-perception; but in this process it is not the things themselves that we see but the signs of things,—mere mental states which they induce in us. Thus man can know the world only as it appears to himself, only as it unfolds with the development of his own nature, which is a more or less complete expression of the All-One.

But even in the midst of the prevailing humanism signs are not lacking of the dawn of a new order. Hopeful for the future triumph of scientific method is the revived interest in Neo-Pythagorean number-philosophy. This is most clearly apparent in the writings of Bruno. Thoroughly impregnated with Platonic and Pythagorean speculation, Bruno conceives of the world as composed of an infinite number of monads or metaphysical elements, each reflecting in its individual life the divine nature which seeks expression through it. Man finds his place in the world-scheme as a more perfect mirror of the Creative Unity than the monads by which he is surrounded. But more significant for science is the connection that Bruno establishes between the monad and the physical atom. This latter conception is plainly borrowed from the nature philosophy of the Greek atomists passed through the medium of Epicurean thought. Its fruitfulness lies in the fact that Bruno returns to the Pythagorean view that things in the last analysis are determined by the geometrical forms of their elements. All qualitative differences may be resolved into quantitative arrangements of atoms of varying geometric forms. Thus Aristotle's ruling theory that all forces are qualitatively determined and must produce certain ends is smitten at its root. Furthermore there is in Bruno's thought the

same dim apprehension of the numerical relations existing among physical elements that appears in the writings of Plato¹ and the Pythagoreans. Nature is a vast system of geometrical forms and number relations. Harmony is brought into the universe by the combination of atoms in definite numerical proportions. Thus there reappears in the sixteenth century the ancient conception of the intimate correlation of mathematics and physics,—a theory which, in the masterly handling of Kepler and Galileo, is destined to prove the reliable tool of modern scientific research.

But there can be no genuine natural science so long as man remains unconscious of the degree in which his thought-systems are warped by his own preferences and hindered by his ardor for the immediate mastery of all truth. To storm the stronghold of nature with the untested weapons of the imagination, is child's play when compared with the endurance and detachment from self demanded of patient besiegers. Hence astrology and magic masquerade in the garments of science, and their unfruitfulness testifies to the meagre knowledge of chemical elements and energies possessed by their devotees. In the writings of Paracelsus, Pico della Mirandola and Campanella may be discerned the same ardent desire to discover a philosopher's stone, a mystic formula, a magical potion which shall make them all at once the lords of nature. Then, indeed, shall they become the true benefactors of mankind by the eradication of disease and pain from human life. This superb confidence in the power of human intelligence to comprehend the workings of nature needs only to be reinforced by a correlative distrust of metaphysical speculation as the proper method in order to produce favorable conditions for the development of a genuine scientific attitude and method. But the time is not yet ripe. Too frequently the thought of the age is in sympathy with the sentiment which the poet puts into the mouth of Paracelsus:

"Truth is within ourselves; it takes no rise
From outward things whate'er you may believe,
There is an inmost centre in us all
Where truth abides in fullness; and around
Wall upon wall the gross flesh hems it in,
This perfect, clear perception—which is truth." ²

¹ Cf. Timaeus, Jowett ed., pp. 637-39

²Browning, Paracelsus

As the herald of a new order, in which natural science is truly conceived, Ludovico Vives is a significant figure. Although he avails himself of the rich learning of the ancients, he yet insists that their conclusions shall be confirmed by individual experience. In his most famous work⁸ he boldly rejects the time-honored notion that self-knowledge must begin with an analysis of the nature of the soul. Rather he asserts that man's chief concern is to know the soul's functions. Now the mind is chiefly employed in gaining experience from the things of sense; hence sense perception is the groundwork of all knowledge. In the thought of Vives appears an interesting attempt to differentiate man from the world of nature. Although he does not wholly reject the Neo-Platonic conception of an inter-penetrating soul in nature, he insists that only the conscious spirits of men are directly divine in origin. The souls of plants and animals are generated by physical forces and perish with the matter that produced them. It is no small step in scientific progress that man is once more distinguished from the material universe as the possessor of rational intelligence, while nature is deprived of spirit and made the abode of purely physical energies. Little could be accomplished in the solution of the pressing problems of nature and of human life until these two universes of discourse had been clearly delimited in man's thought.

Further ground is gained for naturalism in the work of Telesio. Firmly taking his stand on the validity of sense-experience, Telesio criticises his predecessors for seeking to attain knowledge of nature by the exercise of reason alone. "*Non ratione, sed sensu!*" is his guiding principle. Yet Telesio cannot wholly shake himself free from the tyranny of old habits of thinking. Although he explains the physical world in terms of matter and force rather than in the accepted Aristotelian terms of matter and form, he falls back upon the ancient metaphysical conceptions of hot and cold, moist and dry, as primordial sources of all motion. But the importance of his thought in moulding that of Bruno and his successors can hardly be over-estimated. He fearlessly attacks the strong entrenchments of Aristotelianism and carries some of the outworks by storm. Thus he rejects the initial assumption of Aristotle that natural processes can be explained by reference to their accomplished results. Instead

⁸ *De Anima et Vita*, 1538.

he advances the theory that all natural phenomena are the products of two modes of mechanical motion. Moreover Telesio hotly assails the Aristotelian doctrine that the heavenly spheres are guided by spirits, and maintains that their movements are determined solely by their inherent nature. God has endowed every material thing with its own peculiar nature and manner of working. Like the Neo-Platonists Telesio assumes that the atoms of the universe possess life and feeling,—to the eye of his mind all nature appears animate. Thus this Renaissance philosopher dallies with a mechanical theory of the universe only to shrink back from it and introduce once more humanistic ideas into the explanation of natural processes.

In the thought of Telesio man finds his place in the scheme of things as an integral part of nature, gathering up into himself the multifarious aspects of the cosmos. Mind is akin to matter since all knowledge is the product of feeling which, in turn, is the effect of material forces. Body and soul, man is a microcosm, since his body contains all the elements and dynamic powers of nature, and his soul of sense and feeling is played upon by the same principles of motion that operate in the physical world. But at this point Telesio ceases his daring speculations and strives to make his peace with the Church by the assertion that God has not alone endowed man with a material soul but has bestowed upon him an incorporeal spirit united in life with the natural. By this device Telesio allies himself with a constantly augmenting body of philosophers and theologians who find it possible to accept atomistic and mechanical world-views without committing themselves to a materialistic and godless philosophy.

Thus our brief survey of the philosophy of the sixteenth century must lead to the conclusion that, suggestive as it is in theories that were utilized by succeeding scientists, it yet betrays all the fundamental weakness of Greek nature-speculation. In its systems, supernatural assumptions exist in amicable accord with observed facts; categories applicable only in the sphere of the human are found in conjunction with shrewd guesses as to the nature of matter and force. Moreover, as in Greek thought, there is the same eager yearning to penetrate to the heart of things; to grasp in thought the vast range of the universe before its parts are in any wise known; to build lofty temples of thought

upon a slender basis of tested facts, rather than to confine intellectual activity to a well-defined area in which observation and experiment may be persistently carried on.

To Copernicus, Kepler and Galileo is due that remarkable development of naturalism which marks the seventeenth century. By their successful shaping of the keen tool of scientific method, they laid the foundation stones and sketched the plan of the vast structure of modern science. Upon the minds of these men gradually dawned the illuminating idea that observation, unsupported by reflective analysis and experiment may lead the wisest thought astray; that, so far from things being what they seem to the senses, they frequently are in exact opposition to such testimony. Actuated by the conviction that observed experience must be interpreted by reflection and that the hypothesis thus set free must be subjected to tests both continuous and varied, these thinkers achieved results of exhaustless fertility. The outcome of the new method was not only a mass of fresh material for the further investigations of astronomers and physicists, but, more important still, a new point of view regarding the solution of all physical problems. By these early scientists nature was strictly delimited from spirit, and its operations were, in process of time, regarded as the result of the mechanical movements of corporeal atoms. Inveighed against by Bacon as one of the "idols" and by Spinoza as the outcome of anthropomorphism, teleology was ultimately driven from the field of physical science and found its permanent home within the fold of philosophy and theology. Finally, the relation between mathematics and physics, vaguely conceived by the Greeks and later by the Neo-Pythagoreans of the earlier Renaissance, was seized upon and clearly formulated by Kepler, Galileo and Newton.

The significance of Copernicus lies in the fact that he made the first successful assault upon the Aristotelio-Ptolemaic world-scheme and proved to the satisfaction of fair-minded thinkers that the organization of the universe may be in flat contradiction to the evidence of sense-perception. Dissatisfied with the cumbersome and overloaded system of Hipparchus and Ptolemy, Copernicus, like other astronomers of his age, raised the question whether there may not be a simpler method of explaining the movements of the heavenly bodies. His researches in Greek

philosophy had acquainted him with the suggestion of Pythagoras that the sun is the center of the planetary system—a suggestion taken up by Aristarchus three centuries later, and restated in the writings of Nicholas of Cusa at the first dawn of the Renaissance. It is the great merit of Copernicus that he accepted this suggestion as a hypothesis and experimented with it for many years with a view to determining how exactly it fitted in with observed facts. In the course of his reflective study he developed the principle of the relativity of space relations,—one of the most fruitful theories of modern astronomy. He first made plain the fact that, if a motion occurs in space, the percipient cannot at once determine whether the object is moving, or he himself, or whether both he and the object are moving with varying degrees of velocity. Copernicus held that, if the hypothesis of the earth's motion be accepted, it can be demonstrated to an observer on the earth that the heavenly bodies necessarily appear to move about it. But if the observer remove himself in imagination to some point in space he will probably discover that his senses have played him false. Acting on this hypothesis and making use of such crude instruments as then existed, Copernicus finally became convinced that the theory of the annual movement of the earth around the sun affords the true interpretation of a vast body of astronomical data. Thus Copernicus reverses the ancient method of thought and instead of seeking for facts to support an *a priori* assumption he inquires what hypothesis will best agree with and explain observed facts. Henceforward his method becomes the approved instrument of the naturalists, who abandon speculation for experiment, and substitute observation of what is for assertion of what ought to be.

Hardly less potent in the development of scientific method were the discoveries of Kepler. Incited by the Pythagorean notion of definite mathematical relations in the universe, Kepler first develops a philosophy marked by a friendly alliance between Pythagorean doctrines and Christian theology. But he does not linger permanently among these unfruitful speculations. Falling heir to the wonderfully exact and abundant observations recorded by Tycho Brahe, Kepler seeks to interpret them by his theory of quantitative relations in nature. He defends this theory by reference to the psychological fact that the mind most readily grasps quantitative relations, whereas perception of qualitative

differences varies with individuals. Only upon the quantitative side is demonstration of objective truth in any degree convincing. Starting once more from this hypothesis Kepler labors patiently to discover the mathematical relations which will accord with the facts presented in Tycho's tables, and is rewarded by the discovery of the three "laws" of planetary motion.

From this time forth Kepler's methods grow steadily more scientific. His philosophy of nature, abandoning the animistic view of spiritual agencies as the source of the motions of the sphere, approximates more closely to a mechanical world-view. The concept of "cause" is interpreted more and more confidently in terms of physical energy, on the ground that the causes assigned to natural events must be such as can be demonstrated to be operative in nature. Yet Kepler was the child of his age and by no means abandoned his faith in a Divine Architect of the world whose purposes are worked out through the medium of matter and force. "Oh, God! I think thy thoughts after Thee!" he exclaims from a full heart when he has triumphantly verified his third law.

Proceeding upon Kepler's principle that mathematically measurable relations may be discovered in the phenomena of motion and change, Galileo creates the science of mechanics. In the laws of falling bodies, formulated by him, is contained the key to all scientific knowledge of the physical world. Moreover, in his "Dialogus," published in 1632, Galileo confidently states the theory suggested by Plato and the atomists, that all qualitative changes in nature must be explained in quantitative terms. The only qualities we are bound to attribute to things are form, size, and motion or rest.

Most significant of all for the progress of science is the contribution made by Galileo to scientific methodology. By analysis he seeks the simplest types of motion capable of mathematical determination and by a method of synthesis he demonstrates, by experiments with inclined planes, that his mathematical theory, applied to the simple elements of motion, leads to conclusions identical with those of experience. Thus experiment assumes a new meaning and becomes an intelligent isolation of natural processes in order to subject them to exact measurement.

The results of the untiring labors of these early naturalists have revolutionized science and undermined the world-old attitude

toward the universe. So, far from being the center of the cosmos, the earth is only one of a system of planetary bodies whirling around a central sun. The Aristotelian world-view that attached varying degrees of perfection to different spheres of nature receives its death-blow in the seventeenth century and in its place is set the hypothesis of the homogeneity of all parts of the universe. From this theory springs the corollary that man, at least in his physical being, is one with the substances and energies of nature. The gulf between animate and inanimate is at this point bridged. No longer are the heavenly bodies conceived as the abodes of angelic spirits who direct their movements in harmony with a vast design in the mind of the Creator.⁴ Teleology in nature is gradually discredited by science, and natural phenomena, from the motions of the spheres to the falling of a pebble, are henceforth to be interpreted as varying forms of the mechanical principle of motion, acting in accordance with mathematical formulas.

It is not matter for marvel that supernaturalism awoke to its danger and fought desperately to recover its old unquestioned supremacy over man's thought. As an integral part of a despiritualized and mechanized nature, man can no longer be so confidently regarded as the special concern of a Creator who is conceived as constantly intervening in the processes of nature to secure the chastisement or the good of his creatures. The Church foresaw its inevitable dethronement as the sole arbiter of truth, and Catholic and Protestant bodies alike proved inhospitable to the new doctrine.⁵ Lacking insight to perceive that the pragmatic character of its noblest teachings would inevitably secure their survival, the Church arrayed itself as the bitter opponent of science and contested every inch of its advance. But naturalism had come to its own and defended its domain right valiantly against every hostile incursion. Newton verified and extended the work of Kepler and Galileo and afforded convincing proof of the value of instrumental hypothesis in interpreting observed facts and thus in building up a consistent and self-supporting world. Harvey discovered the mechanism of the circulatory system and added the force of this evidence to the

⁴ Cf. Dante's *Banquet* (*Il Convito*), Book II, chap. IV.

⁵ Cf. White, *A History of the Warfare of Science and Theology in Christendom*. Vol. I, chap. 1.

conviction, slowly gaining ground, that the human body is governed by the same mechanical laws that operate in nature.

But the conflict of naturalistic and humanistic views is not confined to the field of physical science. Their sharply opposed methods of investigation and explanation are transferred to the sphere of human society and in particular to that of the State, which is in process of transformation into its modern form. Stimulated in part by the exigencies of changing economic, social, and political conditions and in part by the literature of humanism, which restored to the modern world the ancient Greek view of the functions of the State, a significant group of Renaissance thinkers concerns itself with the essentially human problem of the origin, development and ends of government. First in point of time, and perhaps of influence, in this circle of writers is Machiavelli, arch-cynic and time-server, who yet stands out as the profoundest political thinker of his age. Ripe in knowledge of men and of states, gained in a broad diplomatic experience, Machiavelli is led into an attitude of bitter hostility toward existing social and political conditions. In this spirit of criticism he turns to classic literature and becomes enamoured of the pagan conception and administration of government. To imitate antiquity and to reproduce in the Italy of the sixteenth century the power and material well-being of Greece and Rome becomes his dominant ideal. But he clearly perceives that this end can only be realized when Italy has shaken itself free from the iron hand of the Church and has rigidly restricted the influence of the latter to the sphere of religion. To Machiavelli the State is not a divine order but is the purely natural outcome of human necessity and interest. As such its function is to extend its power and to procure for all its citizens such conditions as shall redound to their material prosperity, health and wisdom. The State then exists not only to advance its own prestige and authority but to secure the well-being of its members.⁶ But Machiavelli too frequently ignores the latter end in his zeal to secure the former. In his shrewd and able work "*Il Principe*" he magnifies the greatness of pagan ethics at the expense of Christian morality, with its doctrine of self-effacing humility. Hence he does not hesitate to urge his Prince to deeds of

⁶ Cf. *The Prince*, Morley ed., p. 143.

audacious daring, mean duplicity and cold-blooded cruelty which he justifies so far as they serve to upbuild the glory and strength of a unified Italy.⁷

Despite his naturalistic view of the origin of the State, Machiavelli reveals little of the scientific interest and method of the naturalists. Unlike Cardanus, the Italian physician and mathematician, who regarded the State as a natural organism revealing conditions of health and disease that might be diagnosed and treated by pseudo-scientific methods, Machiavelli gave little attention to the actual constitution and forces of human society. He was too thorough a humanist in his absorption in the game of political intrigue and mastery to recognize or rightly to estimate those vast economic forces of mechanics, commerce and productive industry, in their relation to a slowly developing science, which were destined to shape the modern State.

In the social theories of Campanella, More and Bacon the contemporary discoveries of natural science are evaluated solely with reference to the improvement of the material and social conditions of human life. Although these men accept the view of the body politic as a natural order, they unite in maintaining that human insight and reflection may result in producing an ideal state grounded upon social relations that are purely natural in origin. In such a state religious freedom would be conceived as a natural right and complete toleration would be enforced despite the protests of warring religious sects. In the "New Atlantis" of Bacon, the "Utopia" of Sir Thomas More and the "City of the Sun" of Campanella, the principle is advanced that experiment and research with their resulting discoveries and inventions are to be utilized for the control of natural processes in the interest of human well-being. Into the mouth of the "Father of Solomon's House" Bacon puts the words: "The end of our foundation is the knowledge of the cause and secret motion of things; and the enlarging of the bounds of human empire to the effecting of all things possible."⁸ Again in the "Novum Organum" Bacon sounds the same humanistic note: "Now the true and legitimate goal of the sciences is none but this: that human life be enriched with new discoveries and

⁷ Cf. *The Prince*, Chapters XVII, XXVI.

⁸ *New Atlantis*, Cassell ed., p. 176.

wealth."⁹ In Campanella's ideal city the rulers are chosen for their scientific wisdom. No man merely versed in book-knowledge is regarded by these citizens as truly learned since he "has given his mind with useless result to the consideration of the dead signs of things. Hence he knows not in what way God rules the universe, nor the ways and customs of Nature and the nations."¹⁰ It is clear that in this passage Campanella has aimed a shaft at the enthusiastic humanists of the period who were so immersed in the learning of the ancients that they were blind and deaf to the needs and tendencies of their own formative age, and in particular to the vigorous growth of science. Yet, although Campanella urges an empirical study of nature, which must ultimately be interpreted according to its own laws, his empiricism, as has previously been suggested, is deeply dyed with supernaturalism and humanism. All the phenomena of nature are manifestations of the indwelling life of God. Man must observe nature; but he perceives, not the things themselves, but the inner feelings they arouse in him. As a microcosm his knowledge of the universe is bound up with his developing knowledge of his own capacities. From this view-point nature simply furnishes a necessary stimulus to self-knowledge and her so-called "laws" are evolved by man from within his own consciousness as a means of harnessing the energies of nature to serve his all-important purposes. In this Titanic labor it is the function of the State to disseminate all forms of useful knowledge and to secure by this means the material and spiritual advancement of its citizens. Thus the State exists for man, man only in part for the State. In taking this position Campanella allies himself with the humanistic social philosophers of all ages from Plato to Rousseau and Hegel.

In the Protean nature of Michel de Montaigne all the many-sided interests of the Renaissance find some degree of expression, although his prevailing attitude is ardently humanistic. In the *Address to the Reader* which serves as a preface to his "Essais" he boldly strikes the keynote of his theme. "Je suis moi mesme la matière de mon livre." He might well have added,—myself as the mirror of mankind. Gathering up into himself the intense

⁹ Nov. Org., Oxford Press, p. 57.

¹⁰ Cf. Campanella's City of the Sun in *Ideal Commonwealths*, Routledge ed., p. 230.

individualism of the Renaissance, he finds his chief interest in the explication of human nature and turns with cold indifference from the political and religious controversies of the age which served to hinder man's understanding of the puzzle of absorbing interest—himself. Untrammelled by the bonds of custom and tradition, he sets sail upon unknown seas of speculation, guided solely by the impulses of his own nature in which he places serene trust. Yet Montaigne has no confidence in the evidence of sense-perception which reveals to us not the objects themselves but our own inner states. These vary not alone with different moods and physical conditions but are markedly unlike in different individuals. Hence the senses must be checked up by experience and the counsels of reason, and each reason in turn demands some other to support it. How, then, is a system of unalterable truth in any degree possible? Moreover, like Protagoras, Montaigne was impressed by the changing ideals, customs and laws of historic races and with the fact that no universal law that might be termed "natural" prevails among them. These considerations lead our author, as they led the famous sophist before him, to a pronounced sceptical attitude toward knowledge of universal and final validity. Yet Montaigne's philosophy leaves the reader in no slough of despondent doubt. If objective and eternal truth seems an idle dream, yet every man may find within the depths of his own spirit a controlling character, a nature uniquely his own which constitutes his norm and in the last analysis is unchanging. Let each man seek to know himself, to heed the voice of his own nature, and strive by the exercise of reason and will to develop his peculiar powers in harmony with Nature's original intention. Thus in Montaigne the Greek concept of an all-controlling nature is linked with the Renaissance view of the supreme import and worth of personality.¹¹

Rendered bitterly averse to all dogmatism by his broad and intimate acquaintance with humanistic literature, which had nurtured in him a marked scepticism toward all accepted opinion and usage, Montaigne again and again turns the keen weapons of his criticism against custom, that "violent and treacherous schoolmistress" who, little by little "slips in the foot of her authority." In those parts of the world where she has had free sway

¹¹ *Essais*, I, 19, 36; II, 11; III, 13.

no opinions have been too extravagant to be established by her as laws. He who is self-reliant enough to emancipate himself from the rule of Custom "would find several things received with absolute undoubting opinion, that have no other support than the hoary head and rivelled face of ancient usage."¹² Yet Montaigne has nothing of the ardent spirit of the social reformer and urges submission to the existing body of law on the ground that there cannot so much benefit accrue from its modification "as there is danger and inconvenience in altering it."¹³

In the well-known essay "Of the Education of Children," Montaigne urges the tutor to familiarize his charge with the eloquent records of history and philosophy that he may "converse with the great and heroic souls of the best ages." But not alone by fixing a reflective backward gaze upon the past can the intricate web of human nature and human life be unravelled. "This great world . . . is the mirror wherein we are to know ourselves as we ought to do in the true bias. . . . So many humours, so many sects, so many judgments, opinions, laws and customs, teach us to adjudge aright of our own, and inform our understanding to discover its imperfection and natural infirmity, which is no trivial speculation."¹⁴ Thus the present and the past alike are to assist man's eager search for the key that will unlock the meaning of his own nature.

So heart-whole an advocacy of the humanistic world-attitude would seem to exclude from Montaigne's philosophy all trace of naturalism. Yet he is so truly the product of his age, fashioned by its spirit and its thought, that a naturalistic view looks out confidently at the reader from some of his pages. Reference has been made to his theory of a prevailing nature in every individual which determines his world-view and hence his thought and conduct. In harmony with this thought are the social views expressed in his "Essay on Cannibals." Like many another thinker of his time, Montaigne's imagination is quickened by the undreamed of discoveries of dauntless voyagers to the New World. After listening to the glowing tales of a servant in his employ who had spent ten years or more in the region of Brazil, he writes: "I find there is nothing barbarous and savage in this

¹² *Essays*, Hazlitt ed., p. 127.

¹³ *Ibid.*, p. 130.

¹⁴ *Ibid.*, p. 187.

nation. They are savages at the same rate that we say fruits are wild, which nature produces of herself and by her own ordinary progress; whereas in truth we ought rather to call those wild whose natures we have changed by our artifice and diverted from the common order. Neither is it reasonable that art should gain the preëminence of our great and powerful mother nature."¹⁵ Clearly, Montaigne expresses here the same trust in the unerring method of nature, when operating in societies and races, that animates him with respect to individuals. He rails at the philosophers who wisely "send us back to the rules of nature," but who "falsify them and present us her face painted with too high and adulterate a complexion, whence spring so many different pictures of so uniform a subject. As she has given us feet to walk with, so she has given us prudence to guide us in life. . . . The most simply to commit one's self to nature, is to do it most wisely."¹⁶ In this passage nature is conceived as an orderly and all-controlling force which has made man what he is and which may be trusted to work out his final good. Again it is nature *in man* which is Montaigne's chief concern. The study of nature as a system of material forces is wholly subordinate in his philosophy to reflection upon its operations in the spirit, institutions and ideals of humanity. Indeed he advises the teacher of a growing youth as follows: "After having taught him what will make him more wise and good (i. e. the humanities) you may then entertain him with the elements of logic, physics, geometry, rhetoric; and the science which he shall then himself most incline to, his judgment being beforehand formed and fit to choose, he will quickly make his own."¹⁷

In this cursory study of the warring attitudes and interests of the pregnant era of the Renaissance, the successive conquests of naturalism are no less marked than the prevalence of humanism. As in the formative age of Greek philosophy, the domain of thought is once more rent asunder by opposing world-views and in the bitter struggle the naturalists give promise of an ultimate victory. Yet none of these fearless frontiersmen of science, in this or succeeding ages, has attained any insight into the distinctly human character of all his investigations and dis-

¹⁵ Opus cit., p. 253.

¹⁶ Of Experience, pp. 387-388.

¹⁷ Of the Ed. of Children, p. 190.

coveries. Mechanism has become the goal of physical speculation because it introduces mathematical certainty into the fluctuating processes of nature. Yet mathematics is the product of human thinking and the mathematical postulates essential to interpret the data of sense are logical habits, sanctioned by their agreement with nature and their utility for man. Moreover the faculty of observation itself, employed in amassing the facts of a specialized problem, involves the senses, and these in turn their human organs. Finally the purpose that animates all the experiments of the scientists in the realm of necessary causes is a purely human category having its home in a fair domain of human desires and ideal ends. Because he so wills it man may come to conceive of himself as part of a vast, mechanical system, and may even separate himself from both the purposes and the data with which he is concerned that he may estimate the value of both. In so doing he manifests himself as the arbiter of his own destiny in just the degree in which all the conditions and circumstances of his life are brought within the control of a disciplined reason. The science of the naturalists is a man-made structure, the product of human interest, and dependent for its continued existence or decay upon the acceptance or the rejection of nature. From such considerations we are led to recognize the implication of human desire and thought in the blind processes of nature, albeit this truth was hidden from the enthusiastic naturalists of the seventeenth century and, indeed, its clear formulation is of recent origin.

But just as the naturalists erred in failing to render due honor to human purpose as the source and motive power of science, so the humanists were at fault in infusing all nature with those ends and values which were the offspring of their own desires and interests. That nature cannot intend those creatures whose existence is the condition of all intention or purpose seems clear enough. Yet this fact by no means discredits human knowledge or ideal aspiration and effort. Truth reared by human hands in harmony with the facts of experience, and modifiable by them, may prove more fair and lasting a temple than that mighty yet mythical structure, ascribed to the Absolute, which human knowledge may imperfectly shadow forth but may in no wise alter in a single detail.

CHAPTER II

THE DEVELOPMENT OF NATURALISM IN THE SEVENTEENTH AND EIGHTEENTH CENTURIES

In the seventeenth century the problem of nature and of man, in their mutual relations, challenged the keenest minds of the age and produced the widely variant philosophies of Descartes, Hobbes and Leibniz. Shaking themselves as free as they might from the binding control of scholasticism, these men attempted to work out thought-systems which should embody the recent discoveries and world-views of science. To harmonize scientific knowledge with those established conceptions of the origin of the universe and the nature of the human soul, the validity of which was still largely unquestioned, became the gigantic task of the period. The impulse toward systematization of those aspects of experience from which reason had wrested a valid meaning revealed itself with remarkable power and fertility. Thus a metaphysical cosmology, based upon science, held the field against the human problems of knowledge and worth that had shared the attention of preceding thinkers. Inspired by the ideal of an intuitive and deductive science which should introduce the same coherence and meaning into natural phenomena infused by mathematics into quantities and figures, the philosophers of the century effected a union of physics and metaphysics destined to have a powerful influence upon succeeding thought.

Meanwhile science quietly pursued a path which diverged more and more from the speculative highway of the philosophers; and now and again it announced fresh discoveries of far-reaching significance to the human race. The earlier labors of Kepler and Galileo were carried forward by Newton, Torricelli and Boyle while new fields of experiment and discovery were opened up by Vesalius, Harvey and Snell. This was an age when the confidence, alike of scientists and their sympathizers, was undaunted and hope ran high. What marvels might not be accomplished by

the new method of induction! The riddles of the universe that so long had defied man's thought seemed destined to disappear before the conquering march of science.

Such was the impelling ideal of Bacon, who best epitomizes the scientific spirit of the first quarter of the century. Deeply dyed with classic thought and hardly less at home in the Romance literatures of Europe, this arch humanist was yet the greatest popularizer of scientific method that the period affords. In his *Weltanschauung* science exists for human ends; naturalism is alike the product and the tool of human need and endeavor and is amply justified of its children. Though Bacon's knowledge of induction was incomplete and grounded upon scholastic conceptions of the "forms" of things, and though his work in the field of science was singularly unfruitful, yet he was an ardent and effective opponent of a barren speculative physics and a convincing advocate of the method of experiment. In him the age finds a trumpet voice expressing its boundless hope in the victories of science and in the consequent transformation of the life of man. To Bacon's thought man is "the minister and interpreter of nature" who "does and understands so much as he may have discerned concerning the order of nature by observation or by meditating on facts."¹

In presenting his view of the true method of science Bacon fearlessly attacks all preconceptions (*idola*), derived from inheritance, tradition and human association, which interfere with the formation of those valid generalizations from observed facts that constitute science. He is the first of a long line of followers in England to recognize the disastrous effect of implicating mental states, merely subjective and transitory, with that truth whose chief claim to acceptance is its uniformity and universality. He bewails the fact that no one has yet been found with the courage and constancy "utterly to abolish common theories and conceptions, and to apply afresh to particulars an Intellect cleared and leveled."² After this preparatory work shall at last have been accomplished, the whole field of natural phenomena lies open to observation and experiment in the interest of human-kind. But Bacon's dread of human prejudice and predilection, as the prime enemies of a valid scientific method, blinds him to the

¹ *Novum Organum*, Kitchin trans., p. 11.

² *Ibid*, p. 79.

significant contribution of the mind to the formulation of any scientific principles, however simple. His exhortation to "mount by successive steps, . . . from particulars to lesser Axioms, thence to intermediate ones . . . and, lastly in due time, to the most general,"³ reveals clearly enough the mechanical and lifeless character of his idea of induction. Although he urges the formation of provisional hypotheses which may be tested by experiment, yet he displays naïve confidence in the ability of the crudest mind to bend nature to the purposes of man if only it be in possession of the mechanics of his marvellous method. Thus the association of naturalism and humanism in Bacon's thought seems in part an external one. The intimate action and reaction of nature and of mind, whereby the hypothesis is born, applied and tested, seems but imperfectly comprehended by this apostle of science.

Yet, although Bacon may not give full credit to the human aspect of all scientific procedure, his humanistic purpose and interest are profoundly sincere. Indeed it is probable that in his zeal to accomplish results of practical value Bacon defeated his own end. Science claims a certain disinterested allegiance of her devotees and has few favors to bestow upon those humanists whose purpose is purely pragmatic. Devotion to a compelling ideal of truth for its own sake must precede the aims of applied science; the naturalist, pure and simple, opens up a path which the humanists following in his rear may expand into a broad and useful highway.

The balance between Bacon's vast humanistic learning and his enthusiasm for the new knowledge and method is at times preserved with sound discrimination. In a passage in the "*Novum Organum*" he refers to the admiration felt by some men for antiquity, by others for "novelty," while few are able to keep the mean between tearing up what has been established by the ancients or despising the contribution of moderns. "This takes place to the great detriment of the sciences and philosophy, since these are likings not judgments as to Antiquity and Novelty; whereas Truth is to be sought not from the felicity of any particular time which is variable, but from the light of nature and experience which is eternal."⁴ In the alembic of experience

³ *Novum Organum*, p. 84.

⁴ *Op. cit.*, pp. 27, 28.

the truths both of literature and of nature must be distilled. No sounder basis of judgment of the relative values of the sciences and the humanities in developing truth can easily be found.

It is small wonder that this brilliant rhetorician became a powerful influence in the spread of naturalism. Dabbler in science he might be, interested in Persian magic and scornful of the achievements of his contemporaries; yet he opened the eyes of thinking men to the mighty interests and forces which were working toward the dawn of a new order,—an order where natural science was enthroned only to raise fresh problems concerning human destiny. More than a century after his death Diderot proclaimed this English pseudo-scientist the true inspirer of his life-work—the legitimate parent of the great *Encyclopedia* which sought to realize his ideal.

While science is thus finding a convincing advocate in Bacon, metaphysics claims its adherents on the Continent. The revolutionizing principles of the new astronomy and physics inevitably suggest the query: Is nature a purely mechanical system of which man forms but an insignificant part; or is man himself the point of departure in any rational and hence authoritative cosmology? To this problem Descartes and Leibniz bend all their energies and work out contradictory solutions.

In the mind of Descartes the mystery can be unravelled only by severing the universe in twain. The material world may then be handed over to the scientist, while the realm of spirit may be fenced in as a thing apart subject to its own laws. Such a partition of the universe not only surrenders to the Church its own but gives ample recognition to that spirit of individuality, that dominating sense of personal power and dignity which forms part of the rich fruitage of the Renaissance. Thus Descartes as a physicist is enabled to maintain a purely mechanical theory of the material universe while as a metaphysician and a humanist he rests his entire nature philosophy upon the existence of the thinking self. Hence the foundations of his world-scheme are laid in pure humanism.

In the attempt of Descartes to find some bed-rock of truth beneath the doubtful knowledge of his time, he is led to the conviction that knowledge must connect itself by rational steps with that vivid and certain apprehension of our own existence which cannot be thought away. Doubt, however militant, can

never storm the fortress of the self and render man's existence as a thinking being in any degree dubious.⁵ To doubt is to think, and to think is to exist. Upon this sure basis, then, Descartes proposes to rear his temple of truth. Its foundation stones are to consist of those "clear and distinct ideas" which Descartes has elected to regard as "certain evidence" in opposition to the shifting nature of sense perception. Abstract from things all subjective sense qualities and there still remain the concepts of extension and motion which cannot be thought away. Upon these ideal postulates, then, may be constructed a world philosophy in harmony with science.

But what surety has man that these ideas are not introduced by some false and mocking spirit to mislead his thought? It is at this point that Descartes has recourse to supernaturalism to afford the necessary props of his system. Falling back upon the arguments of the Schoolmen, he seeks to prove the existence of a God incapable of falsehood who Himself guarantees the truth of those innate ideas with which the soul of man is endowed.⁶ Having thus sought and found a divine sponsor for his fundamental postulates, Descartes is free to utilize these in his construction of a mechanical world. God has so marvellously ordained the laws of matter and motion that even if he had created no other elements but had "made a chaos the most confused and the most perplexed that poets could describe, they would be sufficient to cause the parts of this chaos to disentangle themselves and to arrange themselves in such good order that they would take the form of a very perfect world. . . ."

Thus, unlike Galileo, whose method of experiment he endorses and whose discoveries in the field of mechanics he accepts, Descartes finds it impossible to initiate his nature-philosophy with experiment. Individualist as he is, he turns his back in the beginning upon the fruitful notion of the hypothesis as suggested, tried out and confirmed by the processes of nature, a notion that enabled Copernicus, Galileo and Kepler to rear the solid foundations of modern physical science. But his metaphysical groundwork once laid, the speculative philosopher becomes the experi-

⁵ *Meditations*, Torrey ed., pp. 114, 115.

⁶ *Ibid.*, pp. 137-147, 178.

⁷ *The World, or, Essay on Light*; op. cit., p. 235.

mental physicist whose later years are largely devoted to investigations in anatomy and physics. Indeed it is probable that his experiments in the sphere of physiology served to convince him of the mechanical character of the organic as well as the inorganic world. Like physical nature, the animal body is an intricate machine.⁸

In building up a mechanical world from a primeval chaos, Descartes brings forward that well-known hypothesis of vortices that was seized hold upon by Fontenelle to combat the theory of Newton. His naturalistic bias leads him to attempt the explanation of present conditions through the mechanical operation of the laws of motion. Yet this naturalism is modified at the next moment by reference to God as the spiritual power which alone can lend "concurrence to nature and allow her to act in accordance with the laws which he had established."⁹ This concession to current religious beliefs once made, however, Descartes ignores all teleological presuppositions. Although he does not deny final causes he does not concern himself with them. Rather he asserts that it would be presumptuous for reason to seek to penetrate the purposes of God.

But although science may not concern itself with divine ends, yet it clearly serves the purposes of man. In the view of Descartes the sciences should be regarded as the instruments of reason, enabling the individual to control nature and thus to liberate his rational powers for wider spheres of usefulness. Philosophy and science are in harmonious coöperation, the one furnishing the ethical aim that should inspire all intellectual effort, while the latter supplies the indispensable means. In the last analysis, with Descartes as with Bacon, the end of knowledge is pragmatic.

A review of this most influential of early modern philosophies reveals some significant antitheses. The whole material world is surrendered to mechanism with the sole proviso that God's will stands behind the clatter of the machinery. Natural events cannot even be said to reveal divine purpose. On the other hand, the whole fabric of knowledge and of reality rests upon the existence of a conscious human soul, whose substance is essentially different from that of matter, and whose innate ideas of God, extension and

⁸ Tract on Man, Torrey ed., p. 275.

⁹ Discourse on Method, Open Court Series, p. 46.

motion are guaranteed by a Creator who cannot deceive. Thus the supremacy of man in his world is duly maintained. To the urgent problem of the possibility of intelligent interaction between a wholly material external world and a purely spiritual principle in man, Descartes furnishes an answer far from satisfying. His description of the mutual influence exercised by mind and body through the medium of animal spirits in the pineal gland¹⁰ seems crude and naïve enough to the scientific thinker of to-day; while his degradation of sense-perceptions and feelings to merely mechanical processes of the body reveals a shallow psychological analysis.

With even stronger humanistic conviction than Descartes, Leibniz takes up arms against that scientific world-view which tended to reduce man to a mere cog in the vast mechanism of nature. But, unlike Descartes, he finds little satisfaction in a complete division of the universe which renders the problem of knowledge and of intelligent action so overwhelmingly difficult of solution. Rather does Leibniz elect to make the spiritual energy of the human soul the underlying essence of all reality, both mental and material. With true humanistic bias he revolts against a cosmology that explains the beauty and harmony of the world in terms of matter and motion in self-initiated action. Yet his scientific studies with Huyghens and his wide acquaintance with the literature of science forbid him to ignore or to minimize the facts pointing to a mechanical theory of nature. Nevertheless, to his human view, rational design clearly underlies all natural events, however mechanical in their apparent operation. Thus Leibniz is confronted with the double problem of maintaining the supreme reality and value of that spiritual principle which is revealed in the human soul and in nature, against the levelling influence of a mechanical world-view, while at the same time attempting a complete reconciliation of teleology and mechanism.

The exigencies of his problem lead Leibniz to formulate a shrewd hypothesis concerning the nature of matter. An exhaustive analysis of the external world reveals, not the extension and motion of Descartes and Hobbes, but force only, or capacity to reveal a manifold within a unity. Energy is the fundamental

¹⁰ *Passions of the Soul*, Torrey ed., pp. 298-303.

category of existence and extension and figure are merely its effects. This penetrating theory, which science seems about to confirm, affords a striking illustration of the fact that the guesses of metaphysicians have not infrequently become the principles of natural science. By thus reducing matter and consciousness to energy, Leibniz is assisted not only in bridging the ancient gulf between matter and mind, nature and man, but in proclaiming the essential spirituality of both. In its final terms reality is psychical energy.¹¹ The universe is composed of *substances simples* or monads, identical in content but differing vastly in dynamic power. Each windowless monad is a *miroir vivant*, independent of any other, containing within itself its principles of development and ceaselessly engaged in "representing" with greater or less completeness, the complex manifold of the universe.¹² This representative power, only dimly revealed in the dark and confused perceptions of the monads composing body, is more clearly displayed by the lower animals, and is most fully set forth in the rational work of "apperception" of which man alone is capable. The human soul is architectonic,¹³ and like the Supreme Entelechy, is perpetually employed in the construction within itself of an intelligible and satisfying world. That the mind is constantly active may be established by an analysis of our simplest perceptions. Crude and confused as they may be, they yet bear the marks of rational activity in the evolution of many sensations into intelligent apprehension of an object.¹⁴ Moreover man's ceaseless craving for happiness, or greater fullness and harmony of life, acts as a continual spur to the appearance of new and more complex perceptions. Desire lies at the foundation of conscious life. Thus Leibniz anticipated the dynamic psychology of the present age by two centuries.¹⁵ In the capacity to unfold his nature in clearer and more distinct perceptions and to present to himself not alone an external world related by *lois de convenances* but a rational world of necessary and eternal truths, man reveals his individuality.¹⁶ Not only are human souls

¹¹ *Principes de la Nature et de la Grace*, §§ 1-4.

¹² *Ibid.*, § 13.

¹³ *Ibid.*, § 14.

¹⁴ *Nouv. Essais*, Ch. IX, §§ 8-11.

¹⁵ *Monadologie*, § 14.

¹⁶ *Principes*, §§ 5, 7. *Monad.*, § 33.

immeasurably superior in representative power to the lowest order of monads but they vary widely among themselves. Those fortunate spirits who can grasp not only the contingent laws relating natural phenomena but the higher truths which form an intelligible and moral world-order, grounded in the nature of the First Cause, may mount to a comprehension of God himself, and become members of a fair and divine city.¹⁷ To such enlightened souls the pain and imperfection of earth disappear in the beauty and order of the whole, and they gladly proclaim this universe to be the best of all possible worlds that God could have chosen to create.¹⁸

Although Leibniz may seem to have reestablished the supremacy of individuality, alike in lower orders of life and in human nature, yet there appears but a small degree of freedom in the effort of each individual monad after clearness, or the unfolding of its own nature, since this is a necessary process accomplished in exact accordance with divine law. The principle of "preestablished harmony," by which Leibniz seeks to explain the appearance of action of one substance upon another, involves the strict necessity of all events and processes. Indeed Leibniz does not shrink from the logical conclusions of his hypothesis and recognizes no freedom save in the realm of morals. Here he concedes the possibility of free control of passion and desire by reason.

As we have seen, Leibniz's knowledge of science did not dispose him to deny *in toto* the mechanism of natural events. Rather he desired to insert into the apparently mechanical processes of nature the human concepts of purpose, means and ends, and thus bring about a reconciliation of the opposing theories of teleology and mechanism. Hence his assumption that natural laws are purely contingent, i. e., they might readily be conceived as otherwise.¹⁹ They are *principes de convenance*, the choice of divine wisdom.²⁰ Only truths of reason are eternal and necessary. Reason compels us to pass from one contingent truth to another, dependent upon it, and from this to a third, and so on until we are finally led to the conception of a First Cause sufficient unto itself:

¹⁷ *Monad.*, §§ 85, 86.

¹⁸ *Principes*, §§ 10-13.

¹⁹ *Monad.*, § 33; *Principes*, §§ 5-7.

²⁰ *Principes*, § 11.

God is necessary as a principle of explanation, hence he exists.²¹ It may be remarked in passing that this is not the sole instance of the use of the very flaws in philosophical premises to justify the existence of a Divine Being. But his Deity once established, Leibniz can translate the whole series of mechanically connected events in nature into a system of means and ends by which God's purposes are realized. The finite realm of efficient or contingent causes acts in perfect accord with the external realm of final or necessary causes because God has so willed it.²²

Thus Leibniz is seen to be the herald of German humanistic idealism. He illustrates once more the quenchless desire of man to impress his scheme of values upon the universe and to proclaim himself the most perfect work of a Creator conceived in his own image. Moreover he recognizes that man, in attempting to investigate nature, tacitly assumes the intelligibility of its processes. The problem suggested by this fact he meets with the elaborate explanation of "preestablished harmony." It is true that no impressions can enter the soul through the senses and therefore it follows that this central monad perceives itself alone and its own contents. The more comprehensive and adequate the image it presents to itself, the more complete is its perception of the universe. That body and soul, matter and mind, seem to act and react on each other is due to a preestablished harmony set in operation by the Deity at the creation. The monads constituting body and the ruling monad of the soul necessarily agree like two perfectly regulated watches. It would seem to follow that the ultimate perfectibility of man will be in no wise hindered by the apparently mechanical operations of nature.

The vast influence of the systems of Descartes and Leibniz can readily be traced in the thought of France and Germany for many generations. In the system of Descartes the Jansenists and Oratorians of France seek a fresh basis for harmonizing theology and science. The best known of these attempted reconciliations is found in the well-known work of Malebranche "*La Recherche de la Verité*." Here a vigorous effort is made to render Catholic dogma consistent with Cartesian rationalism while preserving a purely mechanical and geometrical theory of nature. Thus by his

²¹ *Monadologie*, § 37.

²² *Ibid.*, §§87, 88; *Principes*, § 16.

identification of valid knowledge with deductive reasoning from clear and distinct conceptions, Descartes stamps an impress upon French thought which it bears for more than a century. Not originality but clearness and intelligibility become its ideal and it acquires that "taste for too simple solutions" which characterizes the whole Cartesian school. From Descartes likewise came the initial impulse to modern humanistic idealism. If truth abides within the human soul, if the external world is not only guaranteed by mind but receives most of its qualities from it, there need but a few courageous steps to bring the thinker to that vantage ground whence he views the entire material world as the product of the rational activity of man. This road Leibniz had partially traversed; but it remained for the German idealists of the eighteenth and nineteenth centuries to carry humanism to its extreme limits.

In England the acceptance of Cartesianism was by no means so enthusiastic as in France. The psychological and ethical trend given to English philosophy was due rather to the naturalism of Thomas Hobbes than to the dualistic system of Descartes. A humanist of no mean ability was this English materialist, as is evidenced by the excellent translation of "Thucydides," published at the opening of his literary career, and by the translations of the Iliad and the Odyssey that marked its close. Yet his interest in the nature, history and institutions of mankind was everywhere colored by that predilection, so marked in early Greek philosophy, for reducing the complex processes of nature and of man to one material principle. Having committed himself heart and soul to the theory that all change whatsoever throughout the universe may be explained in terms of motion in space, Hobbes works out a systematic philosophy on the basis of this hypothesis.²³ Adopting the deductive method of Descartes, he not only constructs a mechanical nature but draws into his world-scheme all mental phenomena and the customs and institutions to which they give rise. Fearlessly consistent as he is, Hobbes labors to explain the data of ethics and politics as the natural products of the motions of the mind.²⁴ Ethical laws are the laws of nature and grow out of man's all-controlling desire for

²³ De Corpore, Calkins ed., p. 22.

²⁴ Leviathan, Waller ed., pp. 1-9.

self-preservation.²⁵ The natural state of mankind is one of perpetual conflict, dictated by self-interest, which the "natural laws" of reason are powerless of themselves to control. Hence the need of a power strong enough to enforce order and secure the persons and property of all men. From this need arises the Commonwealth "instituted when a Multitude of men agree to authorize all the actions of that man, who represents the person of them all, as if they were his own."²⁶ Thus the power of the Sovereign, though absolute and not to be overthrown, is derived from the original agreement of his subjects and is based upon purely natural necessity.

The philosophy of Hobbes, crude and unconvincing though it may be, represents a most suggestive attempt to build a universe upon mechanics in which there should yawn no unclosed chasm between the spheres of nature and of human life. That he finds difficulty in explaining all mental phenomena upon the hypothesis of motion he ascribes to the complexity of the subject, not to the weakness of his assumption. But his courageous naturalism stirred the minds of his countrymen to an opposition which compelled them to clarify their own views. By placing ethics and politics upon a naturalistic foundation Hobbes was the forerunner of the English empirical school which searched for the origin of ethical principles in the constitution of human nature. From the time of Hobbes, English philosophers sought the key to human destiny in the actual facts of human nature and in well-grounded knowledge of human conditions. Thus he advanced the cause of scientific investigation in many branches of humanistic knowledge. Although his vigorous thought was not at first able to combat the sway of Cartesianism in France, after the middle of the eighteenth century his influence was felt in every active and iconoclastic thought-movement, from the materialistic naturalism of Diderot and D'Holbach to the humanistic naturalism of Rousseau.

Even more clearly, through the entire course of the philosophy of the French Enlightenment, may be traced the shaping hand of John Locke. Doubtless it would have been a matter of surprise and regret to this God-fearing, law-abiding

²⁵ *Leviathan*, pp. 89-109.

²⁶ *Ibid.*, p. 120.

English subject of William III could he have appreciated how truly he was the original inspirer of the sensualistic psychology, the extreme naturalistic ethics and politics, the religious scepticism, and finally the bold materialism of the later eighteenth century in France. When Locke called a halt to speculations about the nature of pure Being and the structure and ends of the universe until the limits of human knowledge had been defined, he diverted the minds of French thinkers from metaphysics to epistemology and psychology. Let man examine his own powers and consider to what things they are adapted before he plunges into "the vast ocean of Being."²⁷ If we can discover the methods by which a rational creature, put in a world such as ours, may govern his opinions and actions, "we need not be troubled that some other things escape our knowledge."²⁸ Thus the call is sounded to discover the origin, course of development and confines of human knowledge, with a view to restricting it within limits determined by utility. This is pure humanism and when it is accompanied by a resolute denial of the whole Cartesian theory of innate ideas it finds ardent supporters in France, already wearied of a metaphysics which Malebranche had utilized to strengthen the position of Catholic theology. Moreover when Locke traces all knowledge to sensation and reflection but fails to establish any clear relation between these two or to define his views regarding those processes of which the mind is aware, he affords the French elaborators of his psychology a rare opportunity to ignore the doubtful portions of his theory in favor of that which they believed can be readily established—the origin of all knowledge whatsoever in passive sensation.

Although Locke resolutely refused to enter the arena of metaphysical conflict in order to discuss the vexed question of material and immaterial substances, yet it seems sufficiently clear that, in distinguishing as he does between sensation as a bodily motion and the perception of the understanding, he was granting to the human mind powers quite other than those of material energy.²⁹ This is borne out by his definite assertion that the mind's operations proceed "from powers intrinsic and proper

²⁷ *Essay on Human Understanding*, Preface, p. 31.

²⁸ *Ibid.*

²⁹ *Ibid.*, II, 1, § 23.

to itself, . . . "80 But his alternations between a conception of the mind as entirely dependent upon sensation, even in its functionings, and that of the mind as a source of intellectual activities, merely set in motion by the sting of external objects, proved disastrous to the more spiritual aspects of his psychology. The somewhat superficial philosophy of the French *Illuminati*, with its ideal of simplicity and clearness, took no note of these doubtful issues and concerned itself with the development and exposition of a crude sensationalism.

Locke defines knowledge as the perception of the agreement or disagreement of our ideas.⁸¹ But the content of these ideas is derived from sensation—hence all human thought is sensuous in origin. This theory formed the starting point of the French psychologists. Yet Locke places intuitive knowledge, or immediate perception of our mental states, in the highest rank⁸² and accords to "sensitive" knowledge the lowest place. He is led to this position by the fact that we can have complete certainty of the presence of an idea in the mind but have no such assurance that this idea corresponds to an external object. Between these two forms of knowledge, Locke inserts a third which he terms demonstrative knowledge, or knowledge of ideal relations. Of its validity he is not so certain as in the case of intuitive knowledge,⁸³ since demonstrative knowledge is not immediate but is based step by step upon intuitive knowledge, and slips in reasoning are possible. We can have knowledge no further than we have ideas or perceptions of their relations and these are limited perceptions. Even sensitive knowledge reaches no further than the existence of things present to sense organs not over-delicate. Thus the extent of our knowledge "comes not only short of the reality of things but even of the extent of our own ideas."⁸⁴ In the hands of Voltaire and the Encyclopedists this theory became a powerful weapon wielded in the cause of pragmatic as opposed to purely speculative thinking.

The essential humanism of Locke, his faith in the capacity and prerogative of human nature to work out its own salvation in

⁸⁰ Essay, II, 1, § 24.

⁸¹ Ibid, IV, 1, § 2.

⁸² Essay IV, 2, § 1.

⁸³ Ibid, § 4.

⁸⁴ Ibid, § 6.

every field of experience, if given a free hand, is the animating motive of his "Letters Concerning Toleration" and his Essays "Of Civil Government." To French thinkers, cramped and held in subjection by the unyielding absolutism of Church and State, these works were a proclamation of mental and moral emancipation. Their broad and humane spirit aroused enthusiastic faith in human possibilities of attainment, and their influence is clearly apparent in the social philosophy of Montesquieu, Helvetius and the Encyclopedists.

Thus in the eighteenth century the natural rhythm of thought results in France and elsewhere in a movement away from metaphysical speculation and toward a more adequate understanding of human nature, its functions and possibilities. As in the age of the Greek sophists, philosophy concerns itself with the problem of man's place in a universe which is now widely conceived as mechanical in its operations. What is the nature of mind, what are the limits of its certain knowledge, and how may this knowledge assist in solving urgent problems concerning human good? The hostile attitude of the Church in France toward all independence of thought in grappling with these questions arouses feeling to a fever-heat. Despotic authority provides a fertile soil for the reception of the revolutionizing ideas of Locke, Bacon and Newton as presented in Voltaire's "Lettres sur les Anglais," and in the more moderate "Esprit des Lois" of Montesquieu. But once sprouted, these seed-thoughts produce a harvest, not of empiricism but rather of a sensualism which speedily develops into the crudest materialism. Accepting the principle established by Locke that every idea must prove its truth by its origin in experience, the philosophers of the Enlightenment applied it with startling effect to current notions in religion, ethics and politics. Supplemented as it was by Voltaire's dogma of the all-sufficiency of reason and by the doctrine of natural right, worked out by the social theorists of the seventeenth century, it resulted in the production of a philosophy dominantly humanistic which yet was conceived in the spirit and elaborated by the methods of naturalism.

Until after the middle of the century the forces of reason and enlightenment are captained by Voltaire and Diderot. But many able leaders of lesser influence are in the field and add their quota to the development of a philosophy essentially pragmatic and sensualistic. Every department of human experience finds

its ardent investigators, animated rather by desire for clear and systematically organized conclusions than by that spirit of patient research which would first examine exhaustively into the nature of its data. The domain of psychology and epistemology is taken over by Condillac and Helvetius, the sphere of social institutions by Montesquieu and Diderot, the realm of metaphysics by La Mettrie and D'Holbach. But the animating spirits of the entire movement are Voltaire with his impassioned advocacy of human reason, as against the stubborn and oppressive dogmatism of tradition, and Diderot spurred on by the eager desire to organize and extend human knowledge for the betterment of human society.

The psychological foundations of the philosophy of the Illumination were laid by Condillac. Going beyond the conclusions of Locke, he attempted to establish the proposition that all the elements of consciousness, not alone its content but its functions, are merely modifications of passive sensations. Each sense perception is a purely passive modification of consciousness. Scientific knowledge results from a careful analysis of this congeries of sensations. The mind acquires its faculties of attention, comparison, abstraction, judgment, since these are merely the effects of sensations, simultaneously present to consciousness. Thus attention is aroused if one sense modification is vivid and persistent enough to exclude others. Comparison is nothing but simultaneous attention to two sensations. In his best-known work "*Traité des Sensations*," Condillac compares man to a statue whose mental activities are awakened one after another. Yet, since he has grounded knowledge upon attention and analysis of sense-impressions, he recognizes the need of furnishing some motive power to set the whole machinery in motion. This he supplies by his theory of pleasure and pain as particular kinds of sensations bestowed by the Creator upon man as a means of stimulating attention and thus inaugurating the process of analysis. Through comparison of sensations of pleasure and pain, instincts and desires arise and influence the development of the various faculties. From this imperfect explanation it seems clear that Condillac was seeking to organize mental life on a basis of feeling; but the tardy development of the biological sciences rendered his task too difficult for his powers.

The mechanical character of Condillac's psychology is sufficiently apparent. Its reduction of mind to the humble rôle of a mere bearer of contending sensations, stamped upon its passive substance by external objects, coupled with its identification of all mental faculties with the conflicts of these impressions, reduces man to a mere puppet of external conditions. Yet this psychology found ardent supporters in France, especially when its humanistic implications had been made plain by Helvetius. In his suggestive work "*De L'Esprit*," this author eagerly strives to establish the vital connection between morality and education, in its widest sense of environing conditions. Assuming with Condillac that physical sensibility is the unique cause of man's thoughts, passions, actions and sociability,⁸⁵ Helvetius deduces from this the corollary that the physical and social environment of man wholly determine his character. The vast difference between the noblest citizen and the meanest social outcast may be traced back, step by step, to its source in education. But education is determined by the form of government; hence the arbitrary and restrictive institutions of France are to be regarded as a source of unmitigated evil. Only when man learns to identify self-interest, the product of his susceptibility to pleasure and pain, with the public good will moral depravity yield place to civic and personal worth. But this supremely desirable result is hindered by the very institutions which should further it. Only a few men have the breadth of knowledge and experience to appreciate the necessity of merging personal interest in public utility.⁸⁶ Man esteems only such ideas as are analogous to his own. Until he is admitted to active participation in public life and his interest in its problems is thus aroused, his ideals will remain self-centered and he will find no sufficient motives for enlightened action in the interest of the greatest number. Morality, education and the nation's laws all rest upon the same ground of public utility. Therefore let the moral philosopher from his lofty vantage-ground indicate the laws of which the legislator secures the execution. Could these principles once be generally accepted "with what facility would the legislator ex-

⁸⁵ *De l'Esprit*, I, 2-7.

⁸⁶ *Ibid*, III, 1.

tinguish the torches of fanaticism and superstition, suppress abuses and reform barbarous customs!"⁸⁷

The reformatory and humanistic tendency of French philosophy is clearly apparent in the work of Helvetius. No sooner has a sensualistic psychology been worked out, than it is eagerly seized upon, not to serve as a point of departure for metaphysical speculation, but as a means of exalting education and of attacking those despotic institutions which confine the intelligence and the moral nature of humanity within swaddling bands. That Helvetius was by no means successful in bridging the gap between self-interest and zeal for the general welfare⁸⁸ should not blind us to the fact that once more, as with the Greeks, morality is based upon the constitution of human nature and its functioning in the life of society.

But humanism does not possess the whole arena of thought even at this period. Naturalism claims its adherents in a group of French philosophers who, influenced by the progress of physical science, would reduce all the phenomena of the organic and the inorganic spheres to modifications of a primitive matter. The movement bears witness to the growing influence that the technique and the conclusions of science are exerting upon man's conceptions of the world and of his place within it. In his much discussed work entitled "*L'Homme Machine*," La Mettrie lays the foundation stones of French materialism. Starting with the assertion that we have no sure ground for maintaining any qualitative difference between man and the brute creation, he brings forward evidence to show the similarity in organization and functions of the lower animals and man. From this likeness he urges a similarity of essential nature. It is but a step further to extend this comparison to plants and then to inorganic nature. From its lowest to its highest forms, nature is endowed with sensation. Psychical life varies with the complexity of nervous organization and its functions are most diversified in man. Anatomy and physiology alike teach the uselessness of the hypothesis of an independent spiritual substance. But because mind is corporeal and our most exalted ideals are only modifications of one primeval matter, that fact should not make us despise

⁸⁷ *De l'Esprit*, II, 3.

⁸⁸ *Ibid*, II, 17.

the soul. Its true greatness should be sought, not in its origin but in its capacity for profound and accurate thinking, and for enlightened action in the service of social reconstruction.

Thus the conclusions of the biological sciences, so recently and incompletely developed, are used as weapons with which to fight a good fight for human emancipation from the slavery of custom. No longer does philosophy assert that man is possessed of an eternal spiritual principle to be rescued from everlasting pain only by the intervention of a Church which has set its face against all change and progress. Rather do the philosophers of the Illumination turn to Nature as a fostering parent who can teach great things to the child she has produced and nurtured, and who proclaims his kinship with herself in no uncertain terms.

All these various strands of speculation are woven into the comprehensive, unsystematized thought of Diderot, and, in a modified degree, into that of Voltaire. But, while Diderot shows the fearlessness of the Greek mind in his eagerness to "follow the argument whithersoever it leads," Voltaire holds ever before him a sturdy belief in the social value of "outworn creeds" and ideals which prevents him from following his contemporaries far along the path toward an atheistic materialism. Yet he was profoundly impressed with that passage in Locke's "Essay" in which the Englishman suggests that man cannot know whether matter may not be made by God to think, "since we know not wherein thinking consists, nor to what sort of substances the Almighty has been pleased to give that power, . . ."³⁹ This suggestion, together with the empirical psychology of Locke, afford Voltaire the foundations of his philosophy. We know as little the essential character of matter as that of the soul.⁴⁰ Hence the materialist who asserts that all is matter, with no knowledge of the nature of that he so sagely discusses, is as likely to be in error as the spiritualist who proclaims the existence in man of a never-dying spiritual substance. Thus with regard to this much-mooted problem of his time, Voltaire elects the middle ground of agnosticism. Here he is content to remain, nor would he squander much time and thought upon these doubtful issues. In the spirit of Locke he exclaims: "O man! God has given

³⁹ Essay, IV, 3, §6.

⁴⁰ Œuvres Complètes, Vol. XVII, pp. 131-132.

thee the understanding to live well and not to penetrate into the essence of the things He has created."⁴¹ Matter may or may not be sentient and eternal⁴² but the solution of this problem is not of vital importance to man. Morality is his chief concern. Centuries have been required to learn one small part of the laws of nature. One day suffices a wise man to learn the duties of mankind.⁴³

But when the question of God's existence is brought forward, Voltaire's agnostic attitude is abandoned. "Every piece of work implies a workman," said Voltaire, and nature is manifestly a work of consummate art. God, then, is needed to fill the rôle of omnipotent Architect. Still more is His existence necessary to supply that constraining influence that shall hold the ignorant *canaille* to a wholesome regard for morality. Without a divine Lawgiver to guarantee the fundamental moral principles, society could not maintain itself against the recklessness and vice of a brutish multitude. "Philosophize between yourselves as much as you please," exclaims Voltaire to a group of advanced Encyclopedists, "but take good care not to perform this concert before the ignorant, the brutal and the vulgar; . . ."⁴⁴

Such was not the attitude of Diderot. Animated by a larger social sympathy and a sincerer faith in the possibilities of humanity than Voltaire, Diderot combined with these impelling motives a distinct leaning toward a positive philosophy, the product of a scientific method. Humanist as he was in his assertion of the essential good of human nature and of its indefinite capacity for improvement, his solutions of current psychological and ethical problems were strongly naturalistic. A fine and true observer of human institutions and human life, Diderot ennobled man by placing a sense for right within his own nature, at the same time that he reduced him to a lowly place in the universe. To the metaphysical query of his time, "Can matter think?" Diderot returned an affirmative answer which he felt to be supported by the facts of science. Physics and chemistry alike furnish evidence that matter is living throughout. "There is but one substance in the universe, in man and in the animal.

⁴¹ *Œuvres Complètes*, Vol. XVII, p. 168, Essay on the Soul.

⁴² *Ibid.*, Vol. XX, Essay on Matter, pp. 51-53.

⁴³ *Ibid.*, p. 196, Essay on Philosophy.

⁴⁴ Lévy-Bruhl, *Hist. of Mod. Philos. in France*, p. 196.

The bird-organ (serinette) is made of wood, man is made of flesh. The canary is made of flesh, the musician is made of a flesh differently organized; but both have the same origin, the same formation, the same functions and the same end."⁴⁵

To the question concerning the origin of knowledge, Diderot's reply was no less prompt and positive. All knowledge is grounded upon sense experience; hence the teachings of revealed religion are unsupported assumptions. Man is a machine, a *clavecin* that responds with thought, feeling and volition to an external world constantly playing upon the chords of sense.⁴⁶ Physics is the basis of all certain knowledge and the sphere of its usefulness is almost indefinitely extended.⁴⁷ It is probable that our means of knowledge reach as far as our real needs and where the means fail the knowledge is hardly a necessity. Clearly Diderot's scientific interest is bounded by his zeal for human improvement. "*D'ailleurs, l'utile circonscrit tout,*" he exclaims in his work on Nature, and to this idea he remains ever loyal.

Despite the lack of entire agreement on certain philosophical issues, Voltaire and Diderot are at one in maintaining the paramount importance of the problems concerned with individual freedom and social betterment. Voltaire brings to their solution brilliant intellect and undaunted courage. Armed with the few dogmas of his natural religion and with a supreme confidence in the efficacy and rights of human reason, Voltaire becomes the mouthpiece of the more enlightened spirits of his own age against the oppressive dogmatism of the Church. To hinder the spread of scientific knowledge was in his judgment a cardinal crime against human welfare which richly merited the overthrow of the institution thus impeding progress. Against the Church, then, he bravely led the attack, again and again, and inspired his countrymen with something of his own hatred of bigotry. Seeing clearly the close kinship of reason and human good, he urged the necessity of free inquiry and fearless utterance of truth, that men might live happier and more useful lives. A centre of ferment he was, a thunderbolt hurled against the unyielding absolutism of an outgrown system. Little by little

⁴⁵ Entretien, entre D'Alembert et Diderot, p. 117.

⁴⁶ Ibid, pp. 114, 115.

⁴⁷ De L'Interprétation de la Nature, p. 13.

prejudice gave way before his attacks and unfriendly minds became hospitable to his gospel of the authority and prerogatives of reason.

To disparage the work of Voltaire because it was purely intellectual in nature, and concerned itself little with the gaunt misery of the toiling masses, would be an ungracious act. A true humanist he was, albeit his gaze was concentrated on but one of the many obstacles to human well-being. That he became better acquainted with the suffering of humanity in his later years is evidenced by the difficulty he experienced in reconciling his views of God's existence and goodness with the misery of man. Thus, in his essay on "Providence" he asserts that the divine power is circumscribed within limits. God is waging a ceaseless warfare against a stubborn and eternal matter and in some instances He is on the losing side. Voltaire has little sympathy with the complacent satisfaction with the world displayed by Leibniz. Instead of maintaining that this is the best world possible he asserts: "*Nous n'avons pas le front de dire: Tout est bien; nous disons; Tout, est le moins mal qu'il se pouvait.*"⁴⁸

No less enthusiastic a humanist than Voltaire, Diderot consecrates his life to the enlightenment of the people of France through his great Encyclopedia. In the *Prospectus* of the work he acknowledges his debt "to the Chancellor Bacon, who sketched the plan of a universal dictionary of sciences and arts at a time when there were not, so to say, either art or sciences." The aim of the Encyclopedia was "not theory but practice, not literature but life."⁴⁹ Diderot was fully aware that knowledge of the facts of physical science would do little to bring about social reconstruction. These facts must be transmuted in the crucible of human experience into guiding principles of practical worth. The many collaborators in the great scheme of D'Alembert and Diderot were men of broad knowledge and social sympathy who profoundly influenced the life of the nation. Into all its phases, economic, political and moral, they infused the principles of a humanized science. With vigorous faith in the possibility of human progress by purely human means, the Encyclopedists turned

⁴⁸ Œuvres Complètes, Vol. IV, p. 299.

⁴⁹ Morley: Diderot, p. 121.

the full light of scientific ideas upon the customs and institutions of the age. Nor did they ignore the enormous importance in the life of society of all forms of productive industry. No one can turn over the pages of this treasure house of arts and sciences without being profoundly impressed by the new spirit which it portrays. The age of engrossing interest in verbal knowledge is past and a new era is heralded, in which things count for more than words, and scientific knowledge outranks speculative dialectic.

But splendid as were the hope and high resolve of these *Illuminati* it is only too evident that their common stock of notions concerning psychology, history, politics and morals had never been subjected to a critical and searching analysis. Ardent adherents of science they might be, but its methods they still neglected to apply to human problems. Hence a certain superficiality and "cocksureness" about their philosophy—a failure to seize more than one aspect of a problem—which the clear-sighted criticism of a later age has ruthlessly revealed. To assert that matter is endowed with sensation because all animal life is possessed of it and because chemistry reveals atomic energy, is not to follow the "secure method of a science." Moreover to ignore, in an analysis of knowledge, all contributions made by the mind itself, as an active and feeling principle, is to grasp but half of a vital problem.

The sensualistic tendency in all French thought of the eighteenth century finds its culmination in the atheistic materialism of D'Holbach. From its mechanical world-view even the Encyclopedists revolt; and Voltaire seizes his pen to refute a doctrine which seems to him to strike at the roots of social morality. The "*Système de la Nature*" published in 1770, is characterized by Morley⁵⁰ as "a thundering engine of revolt and destruction" which produced a widespread shock. Its leading motive is the dependence of social reform upon intellectual enfranchisement and this in turn upon the substitution of a naturalistic world-view for the theistic doctrines of the Church. Matter is eternal and moves ceaselessly by its own energy⁵¹ thus producing all natural processes and events. Natural phenomena are rigidly determined, and no isolated or independent cause can exist in a world where

⁵⁰ Cf. Diderot, p. 157.

⁵¹ *Système de la Nature*, I, pp. 20-27.

bodies are in constant mechanical interaction.⁵² Man is but one of the products of this incessant change and his actions are the expression of an energy which he shares with all other natural things. Because his acts are complex and almost infinitely varied, he fails to see the chain of natural necessity that links one to another.⁵³ Freewill is thus seen to be an illusion and the conception of intelligent order in the universe a human notion rightly applicable only in the sphere of human actions.

Yet D'Holbach's message is not wholly one of gloom and despair. The good man is a feeble spring in the vast machinery of nature, to be sure, but one whose parts fulfil their functions so as to enhance the welfare of his fellowmen. Once more the assertion is boldly made that education, customs and institutions make men good or bad, since they produce the motives of society.⁵⁴ Hence man should cease to search for happiness beyond the boundaries of his own world and should turn to nature that he may learn her unchanging laws.⁵⁵ Science is the true mother of morality. Therefore let man renounce the discredited dogma of immortality and expend his energy in improving the outward conditions of life that make for moral goodness. Let him throw superstition courageously behind him and affirm: "There is no God but Reason!"

Extreme as these views may be in their rejection of every accepted religious dogma of the age, it is idle to affirm their essential immorality. The spirit of an enlightened humanism inspires the entire treatment of man's social relations. But it would be more difficult to disprove the charge of partial and even crude treatment of a subject far less simple than the author is inclined to believe. The crucial problem of *how* man as a mechanical product of nature can estimate and judge of the forces which brought him forth is barely touched upon. Yet D'Holbach recognizes the difficulty and attempts to dispose of it by deriving all mental faculties from feeling. This fundamental capacity is a consequence of the essence and properties of organized bodies, in the same way that electricity and magnetism

⁵² *Système de la Nature*, I, p. 71.

⁵³ *Ibid.*, p. 79.

⁵⁴ *Ibid.*, I, p. 294.

⁵⁵ *Ibid.*, II, p. 210.

are. By means of it man has a criterion for estimating the facts of his experience. Had psychology but developed a little further, D'Holbach might have worked out a more detailed and satisfying account of the relation of the mind to its world.

By the middle of the century the forces of rationalism had lost their initial vigor and enthusiasm. A revulsion of feeling against a philosophy which emphasized reason at the expense of every other human faculty was vaguely stirring and waited only for a mouthpiece. At the moment when the age had most need of him appeared its supreme humanist—Jean Jacques Rousseau. To this child of sentiment his own personality was a microcosm of the external world. From the founts of his own feeling he drew the postulates upon which he built a scheme of life for all humanity. Against the atomistic psychology of Condillac, which makes the mind an aggregate of impressions gained from the outer world, he opposes a theory of natural feeling as the governing principle of all mental life. Endowed at his birth with certain tendencies and feelings, the individual is from the very first a determining factor in his own spiritual development. Thus Rousseau satisfied his intense individualism and expressed in the same breath his spirit of revolt against a cold gospel of reason which seemed to bear no message for the ignorant and downtrodden of the earth.

It has been frequently remarked that Rousseau loved humanity most when he was least in contact with it. However true the epigram may be, the sincerity of Rousseau's ideal human feeling will hardly be questioned. Ill-satisfied with the harvest of rationalism and profoundly distrustful of any human progress which built upon then-existing institutions, Rousseau turns his gaze lovingly toward the past and contemplates a primitive age when the race lived "according to nature," unhampered by human conventions. The complexity and unnaturalness of the life of his age with its sharp distinctions of birth and privilege, with its absentee nobility supporting their luxurious leisure upon the stark misery of the overburdened peasantry, fill him with deep and genuine indignation. Ready to his hand he finds the conceptions of "a state of nature" and a "natural law," and these he uses to the utmost in his construction of a philosophy of sheer humanism.

The idea of a law of nature had its beginnings in Greek philosophy. Passed on to the Romans, it received a legal coloring and resulted in the conception of a *jus naturale* which is higher and more permanent than the *jus civile* and to which the latter should approximate. In modern times this notion was seized hold upon and popularized by Grotius who applied it to ethical and political problems in his "De Jure Belli et Pacis." But French philosophy was most profoundly influenced in its theories of nature by the views of Hobbes and Locke regarding a "state of nature." To Hobbes this state was the original condition of man in which his natural egoistic impulses had free play. But as this freedom resulted in continual warfare, the fundamental instinct of self-preservation forced these atomic individuals to form an artificial social organization made permanent by a contract.⁶⁶ Locke accepts the theory of a state of nature but conceives of it as a social condition of a fair degree of happiness. After describing the origin of government as a means of maintaining the natural rights of life and property, Locke paints a glowing picture of a "golden age" of prosperity and goodness when social life was simple and wholesome.⁶⁷ It was not difficult for his admirers in France to confuse this golden age with the original state of nature and to argue that if such conditions had once existed, their restoration was not impossible.

It is not difficult to detect the shaping influence of these ideas upon the social philosophy of Rousseau. Throughout his various writings the concept of "nature" furnishes the dominant theme and provides the author with his ultimate ideal. No longer is nature conceived as a vast system of interrelated things and forces, but is viewed from a purely human standpoint. In his earlier "Discourses" Rousseau clearly regards nature as a primitive state not far removed from savagery. Rejecting part of the theory of Hobbes, while retaining his atomistic viewpoint, Rousseau writes enthusiastically of the youth of the race, a period when man lived free and innocent in the primeval forests. In this happy age neither society nor knowledge had existence. Far from improving human life, the arts and sciences have worked irreparable injury to mankind. Astronomy was born of super-

⁶⁶ Hobbes, *Leviathan*, pp. 86, 87.

⁶⁷ *Essay of Civil Government*, II, §III.

stitution, geometry of avarice, and physics of vain curiosity. "The Sciences owe their birth, then, to our vices, . . . " "Born of idleness they in turn nourish it," and worse than all they are the parents of that fatal luxury which undermines the morality of nations. Let knowledge, then, "be confined to those men to whom it belongs to raise monuments to the glory of the human spirit." Virtue is "the sublime science of simple minds."⁵⁸

Here is clearly a challenge sounded to the rationalists of the eighteenth century. In a state of nature not knowledge but instinct was the basis of man's happiness and welfare. Wandering about the forests "without industry, without speech, without standing in need of his fellows, as well as without any desire of hurting them . . . "⁵⁹ primitive man was yet happy in the untrammelled development of his own impulses and desires. Only when some mistaken mortal enclosed a piece of ground and "took it into his head to say 'This is mine,'" was the human race plunged into "servitude and misery."⁶⁰

It is not within our province to criticize the lack of historic sense or of historic knowledge which characterizes Rousseau's first two "Discourses." Rather must our interest center upon this his early view of nature, a term admitting of various interpretations. From the brief extracts cited it seems apparent that Rousseau regards the original nature of man, unformed and unhampered by any human conventions, as the norm by which to test the worth of all social institutions. It is as if Rousseau affirmed that the original as opposed to the acquired or the artificial is the normal and the right. Thus his view claims kinship with that of the Cynic philosophers of Greece and, in a lesser degree, with the nature philosophy of the Stoics. Yet Rousseau does not agree with Hobbes that men in a state of nature are fairly equal in bodily and mental powers. Only in opportunity is there equality even in the state of nature.

In the "Contrat Sociale" Rousseau abandons his destructive attitude toward society and attempts a serious study of the conditions under which a State can exist and actually promote the welfare of its citizens. Yet at the very outset he dallies with his

⁵⁸ Discours . . . des sciences et des arts . . . , pp. 44 et seq.

⁵⁹ Discours sur L'Origine . . . de L'Inégalité parmi les Hommes, pp. 108, 109.

⁶⁰ Ibid, p. 116.

earlier concept of nature in the statement, "Man is born free, and everywhere he is in chains." His problem, then, is "to find a form of association which may defend and protect with the whole force of the community the person and property of each associate, and by means of which each, coalescing with all, may nevertheless obey only himself, and remain as free as before."⁶¹ Here speaks the intense individualism of the eighteenth century in the language of its supreme individualist. Clearly, to Rousseau the judgment of Aristotle that "Man is by nature a political animal" carries little weight. Rather does man appear to his partial insight as an atom forced into an artificial relationship with other like atomic beings to secure certain individual ends. That social institutions are a natural outcome of human instinct and interest and furnish the necessary means for the development of a truly "natural" human being, as distinguished from the brute, is a thought which never fully dawns upon his mind. We "must choose between making a man and a citizen," writes Rousseau in the "*Émile*," "for we cannot make both at once."⁶² Yet he is feebly groping within his own nature to find some bond of social union which shall not be purely external. In his discussion concerning the people as sovereign he asserts that this body, being formed only of individual members, can have no interest contrary to theirs.⁶³ The general will, representing the sum of particular wills, after individual differences have been cancelled, can do no wrong, and to its decrees every citizen must conform. How an aggregate of individual desires, each expressing self-interest, can result in an intelligent regard for the common good is a problem too difficult for any one save a Rousseau to solve. If nature has left out of the make-up of man all spontaneous social instincts and sympathies, the omission would seem to be fatal to any enduring human association.

In justice to Rousseau, however, it should be remembered that he expressly states in the "*Social Contract*" that the civil state produces beneficent results for man not possible in the state of nature. "Although . . . he is deprived of many advantages that he derives from nature, he acquires equally great ones in return; his faculties are exercised and developed; his ideas are

⁶¹ Soc. Cont. p. 109.

⁶² *Émile*, p. 1.

⁶³ Soc. Cont., p. 123.

expanded; his feelings are ennobled; his whole soul is exalted to such a degree that if the abuses of this new condition did not often degrade him below that from which he has emerged he ought to bless without ceasing the happy moment that released him from it forever, and transformed him from a stupid and ignorant animal into an intelligent being and a man."⁶⁴ That Rousseau should so clearly have recognized the benefits of social living while still maintaining the notion of the artificial character of the body politic is evidence of a certain shallowness and inconsistency of thought which pervades his whole work.

A striking picture of wholesome community life based upon common (hence "natural") human feeling is portrayed in the "Nouvelle Héloïse." In this old-fashioned novel of sentiment, Rousseau takes a hopeful view of society as made possible by the community of interests, emotions and aims among its members. On the manorial estate of the Wolmars the goodwill of master and mistress toward their employees is shown not in "smooth and fruitless speeches, but in real service and continued acts of benevolence."⁶⁵ "Servitude," exclaims Rousseau, "is a state so unnatural to mankind, that it cannot subsist without some discontent."⁶⁶ Therefore let the heads of the manor see to it that this natural discontent be reduced to a minimum by un-failing kindness and active benevolence.

But Rousseau's more organic view, which seeks a natural social bond in altruistic feelings and instincts, or in a "general will" working for the common interest, is definitely abandoned in the "Émile." Once more the *ignis fatuus* of a "state of nature" lures Rousseau away from the sane and constructive standpoint toward which he was feeling his way. "The natural man is complete in himself; he is the numerical unit, the absolute whole, who is related only to himself or to his fellow-man. Civilized man is but a fractional unit that is dependent on its denominator, and whose value consists in its relation to the whole, which is the social organization. Good social institutions are those which are the best able to make a man unnatural, and to take from him his absolute existence in order to give him one which is rela-

⁶⁴ Soc. Cont., p. 114.

⁶⁵ The New Héloïse, II, 328.

⁶⁶ Ibid, p. 353.

tive, . . . ”⁶⁷ This passage is highly significant as setting forth what was probably Rousseau’s final conception of nature and society. Plainly the “natural,” i. e., original man, is strongly egoistic and self centered, at least in his earlier years. To place the child in a social *milieu* from his birth is to warp and distort his nature. Hence away with him to the country, where a simple, individualistic mode of living in harmony with his inborn tendencies is rendered possible. Here, in close touch with an external nature, toward which he is instinctively drawn, he will develop into natural, unspoiled boyhood, and if freed from all human constraint will find out for himself those inflexible laws of nature which he cannot with safety infringe. It will be time enough to teach Émile of his relations to his fellow-men when his tardy social instincts make their appearance.

Thus to the meaning of “nature” as a state of primitive simplicity and independence must be added two further significations: (1) nature as the sum of original impulses, and (2) nature as a system of external things acting in accordance with purpose or law. The second of these meanings is that which leads Rousseau in the “Confessions of a Savoyard Vicar” (Émile, Book IV) to break forth into a panegyric upon the wondrous creative design so clearly revealed in the universe—a design which arouses in man the spirit of adoration for its divine Author. In Rousseau was undoubtedly a spiritual element, the product of his sensuous feeling, which impelled him to affirm the reality of God, not alone because of the beneficent order of the cosmos, but because the existence of the Deity is “traced upon every heart.” He charges the philosophers of the *Illumination* with undermining all the most glorious and consoling emotions of human nature. God may escape our senses and understanding but man’s deepest feeling proclaims his reality. Once more Rousseau makes his own inner moods and emotions the starting point of his philosophy of man. That the Christian or the atheist is privileged to use the same subjective criterion in arriving at a totally different conclusion seems to have escaped his notice.

When Rousseau grapples with the problem of the social education of Émile, he makes the noteworthy assertion that moral ideals are “not merely abstract terms, pure moral creations

⁶⁷ Émile, pp. 5, 6.

founded by the understanding, but real affections of the soul enlightened by reason . . . ; that by reason alone, independently of the conscience, we cannot establish any natural law; and *that the whole law of Nature is but a delusion if it is not founded upon a need natural to the human heart.*"⁶⁸ Here we come upon the kernel of Rousseau's doctrine. Not only is the natural that which is original but it is expressed rather in spontaneous emotion and desire than in rational thought. This is the heart of Rousseau's gospel and this passionate faith it is when combined with a golden utterance, that renders him a mighty force in his age.

As we review in imagination the fruitful epoch of the Enlightenment in France and England, perhaps its most salient characteristic is seen to be a certain dauntless optimism. This spirit reveals itself in two ways. First, there is a sturdy belief in the illimitable perfectibility of the human race. Secondly, this conviction is bound up with a tacit, but none the less ardent, faith in the harmony existing between nature and the purposes of man. Far from being unfriendly to her human child, Nature is regarded as a nurturing mother, prepared to contribute to the utmost to the advancement of a favored offspring. These views receive interesting expression not only in the writings of the Encyclopedists, but in two well-known politico-economic works, namely, Godwin's "Political Justice" (1793) and Condorcet's "Outlines of a Historical Picture of the Progress of the Human Intellect." The first maintains that with the advancement of science and the dissemination of enlightenment the vast differences in individuals will tend to disappear. For men differ less by nature than by circumstances. With the spread of a general enlightenment, also, the wide disparity between wealth and poverty will vanish. Scientific discoveries and mechanical inventions will, under these conditions, become unmingled blessings to the whole of mankind. In such a society sensual desires will become weak and pallid, and intellectual and moral distinctions will alone remain to differentiate men. In time the human species will probably cease to propagate itself, since men will have learned from nature the secret of the indefinite prolongation of life. Such conditions will not necessarily produce the evils of excessive

⁶⁸ *Émile*, p. 210.

population. For it will be a long time before nature's food-supply is exhausted, and meanwhile the proportion of food to population will somehow be maintained.

Condorcet writes in similar hopeful vein. History may be divided into ten great epochs, the first of which is that of hunting and fishing and the ninth the age of the Enlightenment when humanity, tolerance and reason are the animating motives of thoughtful men. The tenth epoch, still unborn, is described by Condorcet as the age of the scientific mastery of nature and of the vast extension of knowledge and intelligence. Man's capacity for progress is unlimited; and this advancement will bring in its train equality of material comfort and prosperity, as well as intellectual and moral perfection. The science of medicine will develop to such a point that human life may be extended without limit. Likewise by the aid of natural science the earth may be made indefinitely productive to serve the needs of its enormous human offspring.

It was such optimistic pictures of a future society, in which reason was apotheosized at the expense of every other faculty of human nature, that called forth the protest of Malthus, written from the standpoint of naturalism. In his influential "Essay on Population" he maintained that the sex instinct shows no sign of weakening with the advance of civilization; and this instinct leads to a constant increase in population. Even as matters then were, there was not room at Nature's table for all her children who were clamoring for food. Yet extreme poverty and vice yearly removed large numbers of human beings and thus held in check any enormous disproportion between the population and the food supply. In Godwin's Utopia, where vice and misery did not exist, there would be no such influence at work to carry off the surplus population. The outcome would be an intense struggle for existence and the reappearance of the old evils of inequality. So long as human nature remained human nature, sexual desire would result in the production of new individuals with little regard to the crucial problem of how they should be fed. Notwithstanding, Malthus urged that the pressure of natural necessity has positive advantages since it sharpens men's wits, leads to discoveries and inventions and thus is one of the most powerful factors in human progress.

Our interest in Malthus' work lies chiefly in the fact that now, almost for the first time, the entire harmony of nature with human purposes is seriously challenged, whether that nature be regarded as an external system of things and forces or as man's original endowment of instinct and feeling. It follows that the indefinite perfectibility of man, so far as this is dependent upon the coöperation of nature, is exposed to grave question. The influence of Malthus upon the thought of his time was deep and far-reaching. What if nature were indifferent, if not actually inimical to the ideals of man? If such were indeed the case, the uninterrupted progress of the human race became an idle dream, a mere phantasy, born of over-confident optimism.

Thus by a long journey we have come to the closing decades of the eighteenth century. The dualistic interpretation of nature and of man in Descartes gave place in time to the dynamic spiritual monism of Leibniz or to the materialistic world-view of Hobbes. The latter, in combination with the fruitful humanism of Locke, gave rise to well nigh all the currents of thought characteristic of the French Enlightenment. Many were the changes rung upon the concept of nature, but man was the starting point and the goal of them all. To the Encyclopedists nature appeared as a purely mechanical system of self-initiated changes—a machine in which man was but an insignificant wheel. But, in their eager desire to get outside themselves and survey nature from a cosmic vantage point, they took but a shallow sounding of the functions of the human mind and of its contributions to the making of experience. Moreover the great lesson taught by history of the intimate relation of human institutions to the outward conditions and inner needs of human life was lost upon these social theorizers. That customs and beliefs "have a history as well as a logic" Montesquieu attempted to make plain, but his message fell upon deaf ears. When the half-century mark was past, Rousseau came forward and with but scant interest in the objective "nature" of the Encyclopedists reduced the concept to a purely human sphere. When he does consent to regard nature as external to man it is only in order that he may derive from such a standpoint support for his religious feeling or satisfaction for his sincere love of natural scenery. Valuable as were the services of Voltaire and the Encyclopedists, these men had no such radical influence upon succeeding generations as had this unhappy apostle of human

feeling. His message proved a tremendous regenerating ferment in the thoughts of men, remoulding their literature, social theory, philosophy, and education. The great humanistic movement of the German Enlightenment, and the idealistic systems to which it gave birth, owe much to the vitalizing theories of this arch-humanist, who first sounded the recall to a more wholesome and simple life in which all the elements of human nature might grow to maturity and power.

CHAPTER III

THE HUMANISM OF THE GERMAN ENLIGHTENMENT

While France had thus given itself up heart and soul to naturalism, which it attempted to reconcile with the humanistic theory of the ultimate perfectibility of man, the German *Aufklärung* was proceeding along divergent paths. The emancipation of human reason was, indeed, as in France, the watchword of the age; but in the earlier phases of the movement this enfranchisement was effected by the effort of every individual to unfold the capacities of his own reason with no dependence upon nature to furnish stimulus, means and guidance. The philosophy of Leibniz, as interpreted by Christian Wolff, had complete possession of the field of speculative thought. Thereon a temple of dogmatic knowledge was reared which but imperfectly exemplified the more profound and fructifying principles of the founder's thought. Indeed Wolff completely lost sight of the basal conception of his master, which affirmed the essentially dynamic character of the soul and its continuous unfolding under the spur of desire for completeness of life. Instead he finds his point of departure in ideas, as the constituent elements of mental life, which reason may elaborate into intelligible systems of knowledge. These fundamental notions concerning God, the soul, and the world are made to serve each as the groundwork for a particular structure of philosophic truth. Thus Wolff, like the spider in Bacon's metaphor, spins from his own mind thought-systems dealing with rational theology, rational psychology, and rational cosmology. The test of truth is in clearness and intelligibility, not in agreement with the facts of experience. Wolff was far from perceiving the deep significance of Leibniz's contention that energy is the fundamental category of experience, of which extension and figure are merely effects. Instead he introduces once more into philosophic thought the Cartesian dualism of extended and thinking substances.

For a generation or more the intelligibility and clearness of the Wolffian system greatly facilitated its popular acceptance. Furthermore human nature was gratified and stimulated by the apotheosis of reason attempted by Wolff and his followers. The confusion of perception and thought, begun by Leibniz, was continued by his successors. Ideas were looked upon as the constituent elements of soul life; perceptions were only dark and confused ideas. Whatever in the soul was not immediately intelligible was conceived as chaos and darkness. "More light!" was the cry of the age, a cry inspired by supreme faith in the efficacy of human reason to promote the advancement of mankind. Individualism thus expresses itself at first in unchecked rationalism.

But by the middle of the century forces were at work to undermine the self-confidence and dogmatic conclusiveness of the Wolffian school. The pietistic movement proclaimed the sacredness and reality of inner feeling and the value of individual differences in religious experience. Thus it opposed itself to all dogmatic thought-systems and urged the importance of right feeling rather than theological exactness. Thoughtful men began to raise the question whether human nature received its rightful due when all mental operations were reduced to modes of reason. Might there not be other functions unjustly ignored in this analysis? In his "*Aesthetica*," published in 1750, Baumgarten first used the term "aesthetics" in the now current sense of a theory of the beautiful. But he followed the tendency of his age in conceiving this theory as laying down rules for the dark ideas of the soul, that is, for the lowest part of the human understanding. As a result of his investigations of aesthetic feeling, Mendelssohn was led to point out the startling conclusion to which this assumption must lead. If the feeling for beauty is associated with mental darkness, then the progress of enlightenment must result in its complete extinction. The cultured man would then be deprived of a fount of purest joy which still would bubble up in the soul of the ignorant. In protest against a view so unwelcome to humanity and so little substantiated by experience, Mendelssohn urged that feeling is an independent element, a positive force in the soul. This was a step forward in the direction of a much-needed differentiation of psychical functions. The work was carried onward by Tetens, who clearly delimited sensa-

tion and feeling. He protested against the practice of the Wolffian school of identifying all factors of psychical life with ideas, and urged that this term be restricted to representations only. The functions of the soul were thus divided into sensation, understanding, feeling and will,—a partition later accepted by Kant as determining the divisions of his critical philosophy.

Thus the rationalistic spirit of early German humanism slowly gives way to an appreciation of the profound value of feeling in the development of human personality. This tendency receives an enormous impetus from the writings of Rousseau, the defender of the rights of sensibility, freedom and natural beauty. The depth and breadth of his quickening influence are measured by the literature of Romanticism both in its earlier and later forms. In the earlier works of Herder, Goethe and Schiller the hand of the impassioned Genevan may be clearly traced. As in France, the needs of the heart are elevated above the calm demands of reason. Outbursts of sensibility are the characteristic of the age. These are combined with an intense pleasure in natural beauty and purposiveness and with a fervent hatred of all restrictions of free individual development, be it in the sphere of government, religion or the intellectual life. These attitudes, in whole or in part, dominate the earlier work of Goethe, notably the "Sorrows of Werther," the "Stella" and the "Prometheus." In the two former, unwholesome sentimentality and weak self-indulgence bear witness to the influence of Rousseau; in the latter the aggressive individualism of the Enlightenment, when brought into contact with tyrannical power, is vigorously portrayed. Confronting the ruler of Olympus, Prometheus hurls in his face the ringing defiance:

Ich dich ehren? Wofür?
Hast du die Schmerzen gelindert
Je des Beladenen? ¹

But the early excesses of feeling consequent upon its tardy restoration to an honored place in human nature are wisely restrained before the close of a generation. A more organic view of social life replaces the atomistic theory of Rousseau. The tumultuous individualism of the "Sturm und Drang" movement is transformed at its culmination into a noble ideal of

¹ Goethe's *Sämmtliche Werke*, Stuttgart, 1881; I, p. 238.

humanity as a whole. No longer is the independent individual, developing his own power to the utmost for the sake of his own delight in free self-expression, the ideal of thoughtful men. The greatest productions of Lessing, Herder, Goethe and Schiller all "lead out of narrow, isolated, fragmentary conceptions of life into the broad daylight of universal humanity. They all tend toward the representation of human nature in its totality."² In them is a prophecy of the golden age when the conflict between sense and reason, natural instinct and social duty, the individual and society, shall end in harmony. More and more the leaders of German thought are brought to a deep realization of the organic relationship existing between man and the state. As a forerunner of this collectivistic ideal, Lessing's conception of the inner connection of nature and history has significance. In his view, God is not apart from but immanent in the world which he has created. Hence the universe represents an eternal process of development from lower to higher forms of life and from barbarous to enlightened stages of social living. Divine revelation has been a means of education of the human race. Although man's reason could have discovered religious truth independently of all revelation, yet without the coöperation of the "One and All" the process of enlightenment would have been vastly more prolonged and difficult.

But the organic view of man and nature, man and the race, finds its noblest expression in Herder. Strongly influenced by Rousseau, he at first constitutes himself an ardent champion of the claims of nature and freedom and the right of every individual to the fullest self-realization. But in his later work he urges the perfection of the national type as the surest road to the perfection of the individual. With penetrating thought, he conceives of history as revealing in its trend a striving toward the just equilibrium of individual and collective forces. In his well-known work, "Ideas for a Philosophy of History of Mankind," published about 1784, he shows the same true historic sense that animated Montesquieu when he asserts that all social institutions are the natural products of human instincts in interaction with envioning conditions. Organic forces are at work

² Francke, *German Literature as determined by Social Forces*, p. 348.

throughout the depth and breadth of nature, and its various forms are the natural products of these organizing energies. The end of the long travail of nature is humanity and the perfection of human powers. But these powers should be regarded as developing under the spur of necessity. Reason is not an innate capacity which flowers into full perfection unaided by the sting of need. Man must learn to reason, which is only to say that he must learn to direct his ideas and powers toward ends of value to himself and the community. Therefore the individual must be educated if he is to become truly man; and this education is complete only if he shares to the utmost in the life of humanity. Through the perfection of the individual, the perfection of the national type is secured; but conversely only through the continuous development of the nation can the individual approach completeness. In his splendid tribute to humanity in the fifteenth book of the "*Ideen*" Herder writes: "All beings have their centre in themselves, and each stands in a well-proportioned relation to all the rest; they all depend on the equilibrium of antagonistic forces, held together by one central organizing power. With this certainty for a guide, I wander through the labyrinth of history and see everywhere harmonious, divine order. For whatever can happen, happens; whatever can work does work Thus history leads us, as it were, into the council of fate, teaches us the eternal laws of human nature, and assigns to us our own place in that great organism in which reason and goodness have to struggle, to be sure, with chaotic forces, but always, according to their very nature, must create order and go forward on the path of victory."⁸

In the passage just quoted it seems clear enough that Herder regards nature as furnishing the "chaotic forces" for reason to wrestle with in its triumphant progress toward the harmonization of all experience. The mature productions of Goethe and Schiller set forth the same view. There is no hint in the fervidly human pages of these heralds of Romanticism of the mechanical conception of the world so enthusiastically proclaimed in France. Man is, in a sense, the product of nature,—the last outcome of orderly forces working according to natural laws. But these humanists by no means look upon nature as the bearer of blind

⁸ Trans. by Francke, *op. cit.*, pp. 327, 328.

energies. Rather are its events and processes controlled by an immanent Reason which, in the fulness of time, brings forth a being, rational like itself, and capable of hastening the great culmination when perfect harmony shall exist between feeling and thought, "nature" and reason.

The hold of Wolffian rationalism upon the minds of thinking men was still further undermined by English thought. The empirical philosophy of John Locke won eager students among the younger followers of Wolff. The empty rational systems of the German philosopher, deduced step by step from untested assumptions, lent themselves readily to the content which empiricism seemed able to supply. Great emphasis was laid upon experience and upon the need for a careful collection of material from nature and from human life, both in its individual and social aspects.

But the rudest shock to the confident dogmatism of the Wolffian school was administered by David Hume. He it was who first conceived the notion that it might be well to investigate the grounds for those ideas of substance, causality and the soul which the philosophic systems of all ages had taken for granted. Then it was that Wolff's finely spun webs of thought disappeared under the rays of a searching sun of criticism. Directing his attack against the age-old principle of causality or "sufficient ground," Hume calls upon reason to declare how such a notion can be formed without the aid of experience. The idea of causality virtually asserts that when A exists B must also exist in immediate succession. But there is no logical necessity which forces reason to affirm *a priori* any such necessary connection. Hume therefore concludes that this notion is born, not of reason but of imagination and experience. From these sources spring certain ideas which are united by the law of association. Now every "idea is copied from some preceding impression or sentiment; and when we cannot find any impression we may be certain that there is no idea." "When the same object is always followed by the same event . . . we then feel a new sentiment or impression, to wit, a customary connexion in this thought or imagination between one object and its usual attendant; and this sentiment is the original of that idea which we seek for."⁴

⁴ Enquiry Concerning the Human Understanding, §IV.

The unity and necessity so characteristic of the notion of causality cannot be the product of experience, for experience is only of the manifold and is in constant flux. Such necessity as attaches to the idea is purely subjective, arising from the habit of associating certain impressions or ideas which have been presented in uniform sequence. Since reason cannot assert of itself that because one thing is, another must of necessity be, its vaunted *a priori* knowledge is nothing but experience masquerading under a false name.

By the same relentless reasoning Hume destroys the ancient conception of substance. If the secondary qualities of color, smell, taste are purely mental perceptions with no original in the world of external objects, then the primary qualities of extension and solidity, which are likewise acquired wholly through sense and feeling, belong under the same category. Thus Hume undermines the fundamental postulates of reason upon which all her lofty towers of speculation had been reared. In so doing he by no means denies the value and even the necessity of these notions in every-day experience. Indeed he urges that the "operation of the mind by which we infer like effects from like causes, and *vice versa*, is so essential to the substance of all human creatures, it is not probable that it could be trusted to the fallacious deductions of our reason, which is slow in its operations, appears not, in any degree during the first years of infancy; and at best is, in every age and period of human life, extremely liable to error and mistake."⁶ Let knowledge, then, confine itself within proper bounds and devote itself to its true purpose, —the preservation and welfare of human life. Investigation of final causes and ends is quite beyond the bounds of human knowledge, limited as it is to mathematics and the facts of experience. "The only objects of the abstract sciences or of demonstration are quantity and number and all attempts to extend this more perfect species of knowledge beyond these bounds are mere sophistry and illusion."

The vital bearing of Hume's iconoclastic reasoning upon the problem of man's position in nature is sufficiently obvious. The individual learns only through experience and experience itself is an unsolved mystery. *Why* there should be sequences in sense

⁶ Ibid, § V.

experience, which are paralleled by sequences of ideas, is insoluble by human thought. Thus reason is dethroned and is assigned a modest rôle in the control of experience. Man once more assumes a humble place in the midst of a world which he can never hope to understand. His boasted *a priori* principles of reason are nothing but the effect of habit strengthened by belief. Even his so-called "scientific laws" may conceivably be overturned by an upheaval and rearrangement of the flux of events and things. A challenge is clearly sounded alike to the humanist and to the naturalist to defend their cherished assumptions or to abandon them entirely and content themselves with far more modest pretensions. Menacing clouds overhang the world of thought. The deep need of the time is for a philosophy of life more satisfying, alike to reason and to feeling, than any hitherto elaborated. This need can only be satisfied when the origin, the nature and the limits of human knowledge have been subjected to a searching analysis.

Roused from his "dogmatic slumbers" by the clarion call of Hume, Kant summons all his powers of penetrating insight and keen logical thinking and constitutes himself an indomitable champion of human knowledge and human faith. The notions of God, freedom and immortality are in his view far too practical and priceless possessions of humanity to be lightly surrendered to scepticism; and the growing body of scientific knowledge is too closely bound up with the interests of human life to be stigmatized as "accidental" and "contingent." Moreover Kant feels a wholesome distrust of a theory which lands its adherents in a slough of enervating doubt. He recognizes that Hume's empirical deduction of concepts and principles, which renders them impossible of application beyond the limits of sense experience, is refuted by the facts. For is there not in existence a body of scientific knowledge *a priori*, namely, pure mathematics and physical science? Kant proposes, then, to avoid on the one hand Locke's error of deducing concepts from experience while yet using them for knowledge beyond the limits of all experience, and on the other hand Hume's destructive attitude of doubt. He makes the experiment of discovering "whether it is not possible to conduct reason safely between these two rocks, to assign to her definite limits, and yet to keep

open for her the proper field for all her activities."⁶ In this statement is a prophecy of Kant's final position regarding the relation of thought and the external world, of man and nature. Reason, so sorely discredited by Hume, is to be restored to her rightful control; but her domain is to be strictly limited and defined.

At the outset, Kant makes it clear that he has adopted a humanistic standpoint; i. e. he regards the mind as contributory to the making of its world. Experience he defines as "the first product of our understanding, while employed in fashioning the raw material of our sensations."⁷ But this experience reveals certain concepts and judgments derived from them which must have originated *a priori* since by means of them we can predicate more of objects than can be learned from mere experience. These propositions, moreover, have the character of universality and necessity which mere empirical knowledge can never furnish. But more surprising than this is the fact that "certain kinds of knowledge leave the sphere of all possible experience, and seem to enlarge the sphere of our judgments beyond the limits of experience by means of concepts to which experience can never supply any corresponding objects."⁸ Now knowledge is made up of judgments, and these are of two kinds, viz., analytical and synthetical. Analytical judgments merely explicate what is already comprehended in the subject; but synthetical judgments add to the concept of the subject a predicate which not only was not originally contained within it but which cannot be deduced from it. Here at once then, is Kant's problem: How are synthetical judgments *a priori* possible? The "Critique of Pure Reason" contains his answer to this crucial query.

In order to carry out a proper division of his subject Kant asserts that "there are two stems of human knowledge which perhaps may spring from a common root unknown to us, viz., *sensibility* and the *understanding*, objects being given by the former and thought by the latter."⁹ The purpose of the

⁶ Critique of Pure Reason, Max Müller ed., Vol. I, Supplement XIII, p. 431.

⁷ Op. cit., Vol. II, Introd., p. 1.

⁸ Ibid, p. 2.

⁹ Ibid, p. 6.

Transcendental Aesthetic is to discover whether there are *a priori* forms of our sensibility under which alone objects can be given to us. By an analysis of rudimentary experience, Kant seeks to make plain that Space and Time are the pre-conditions of all intuition; they furnish the stable, unchanging factor of sense experience, the constant element within the flux of sensation. As the "external" and the "internal sense," Space and Time can be shown to have reality only within the experience of individuals; beyond that field they are merely ideal concepts having no objective validity. Within experience, however, their reality is undisputed. Their function it is to impress upon the crude material of sensation their own "forms." All objects of sense, therefore, are inseparably bound up with the pure forms of space and time. The objects themselves may be viewed in two aspects. As the effects of some unknown thing upon our sensibility they are sensations; as related to that unknown object they are phenomena.

But how is the never-ending flux of intuitions organized into coherent knowledge? Kant replies: By the mind itself which contains certain concepts, or principles of connection, by means of which experience is made into an organized whole. The stability and coherence of our experience belong, not to the stream of phenomena,—for how can sensations arrange and place themselves?—but to the architectonic work of the understanding. At this point Kant is confronted with two problems. First, how can these categories, or pure concepts of the understanding, which seem merely subjective determinations, have objective validity? Secondly, how can the categories be made to apply to so heterogeneous a material as that of sense?

The first question Kant answers by attempting to prove that "the conditions *a priori* of any possible experience in general are at the same time conditions of the possibility of any objects of our experience."¹⁰ Now all will agree that knowledge consists not in separation but in organized synthesis. To this end objects must be apprehended, reproduced and recognized. This leads us to the three great sources of knowledge: (1) intuition, (2) imagination, (3) apperception. By means of the first, as we have seen, the stuff of all thought is furnished. The stream

¹⁰ Op. cit., p. 98.

of phenomena is preserved in the order of its appearance by Time, the internal sense. It is this persistence of all objects in Time that renders possible their reproduction by the imagination. But it is upon the *recognition* of things, as having appeared before in experience, that all possibility of knowing them *as objects* must rest. Now what does this fact imply? Does it not point to the existence of a *self* which maintains its integrity in the midst of all fluctuation? Only if objects be recognized as part of the connected experience of an ego which remains at one with itself can they be thought as objects at all. But there is no coherence in the flux of sense-perception, which presents first one intuition, then a widely variant one, in no logical relationship. Therefore the mind itself must furnish the principles by which experience is made at once orderly and recognizable. Operating through the categories of the understanding, the "transcendental ego" organizes the material of intuition in such wise that experience becomes a related whole.

Kant still has to show how it is possible for these synthesizing principles to operate upon a stuff so heterogeneous to their nature as that of sense? Again he is ready with his answer. Connected on the one hand with sensibility and on the other with the understanding, the imagination, as a synthetic activity, applies its *schemata* to all sense-perceptions and transforms them into concepts. These *schemata*, indeed, are "nothing but determinations of time *a priori* according to rules . . ." ¹¹ and are the only "conditions by which the categories can be given a relation to objects, that is, a significance. . . ." ¹² But it will be seen that the *schemata* not only serve to realize the categories; they also clearly restrict their use to phenomena by imposing conditions of sense alien to the understanding.

In addition to the synthetic work of intuition and understanding, Kant recognizes a third unifying activity in pure reason. Now it is the object of reason "to ascend from the conditioned synthesis, to which the understanding is always restricted, to an unconditioned synthesis, which the understanding can never reach."¹³ To the synthetic activity of reason, then, we owe those concepts of God, the world as a complete

¹¹ Op. cit., p. 129.

¹² Ibid, p. 215.

¹³ Ibid, p. 289.

unity, and the soul as a simple, imperishable substance, free in its operations, which are the foundation stones of metaphysical speculation. What validity have these notions? Do they lead to truth or only to misconception and illusion? Kant replies that they are transcendental ideas "overstepping the limits of all experience which can never supply an object adequate" to them. Yet they are not mere superfluous fancies. For, although no object can be one whit better known by their employment, yet the understanding may be more surely guided forward in its pursuit of knowledge if these concepts serve as regulative principles for the systematic unity of empirical knowledge. Nevertheless Kant's condemnation of the use of these limitative concepts as a means of *extending* valid knowledge is decisive. Such attempts plunge the daring speculator into the sophistical syllogisms of pure reason "from which even the wisest of men cannot escape." The tendency of reason to seek for an absolute whole in the series of conditions is the very essence of its nature; but it produces the antinomies of pure reason which toss the thinker from one horn of a dilemma to the other. With unwonted aptness of phrase Kant terms this mode of speculation a "dialectical play of cosmological ideas." It represents "the brilliant pretensions of reason, extending its domain beyond all the limits of experience. . . ." ¹⁴

Despite Kant's insistence upon the rigid delimitation of the sphere of knowledge, he by no means fails to perceive that human interests are closely bound up in this dogmatism of pure reason. Every right-thinking man, he urges, has a practical as well as a speculative interest in establishing the truth of the transcendent ideas of God and freedom. No such practical, i. e. moral, interest attaches to empiricism, which insists upon keeping strictly to the realm of natural laws and phenomena. The empiricist "would never allow that any epoch of nature should be considered as the absolutely first, or any limit of his vision be considered as the last."¹⁵ He would never approve a transition from the objects of nature which can be analyzed by observation to those which can never be concretely represented by sense or imagination. Now, if the empiricist were satisfied

¹⁴ Op. cit., p. 403.

¹⁵ Ibid, p. 409.

with putting down the presumption of reason in mistaking her true purpose, his efforts would only serve to teach "moderation in claims" and a greater "modesty in assertions." But as a matter of fact, empiricism frequently becomes itself dogmatical and "boldly denies what goes beyond the sphere of its intuitive knowledge, and thus becomes guilty itself of a want of modesty, which here is all the more reprehensible because an irreparable injury is thereby inflicted on the practical interests of reason."¹⁶ Now, although in the phenomenal world of nature there is a strict causal nexus operating by natural necessity, this empirical causality can be conceived, without contradiction, as representing an effect of a non-empirical and intelligible causality. In other words there is no inherent logical contradiction in considering the causality of any being from two sides, "as intelligible in its action, as a thing by itself, and as sensible in the effects of the action as a phenomenon in the world of sense."¹⁷ In this way freedom and nature might exist together in the same event, according as this is referred to its intelligible or to its sensible cause. Yet such speculation, although admissible, does not establish the *reality* of freedom. Nor does it even prove its possibility, since from mere concepts *a priori* we can never *know* the possibility of any causality. Thus the proud claims of human reason are in large measure rejected by its profoundest critic. Indeed it is asserted that this erstwhile dictator is in need of discipline to check its vagaries and to guard against the inevitable illusions springing from them.

Where, then, does this first "Critique" leave the whole enigma of nature and man's relation thereto? Nature, obviously, can be nothing else but the flux of phenomenal appearances, into whose chaos order and intelligibility are brought by the understanding of man himself. Nature, as constituted of things-in-themselves, capable of free, self-initiated action, is a dream of human reason quite impossible of demonstration on speculative grounds. Back of the organizing activity of the understanding is the "permanent and unchanging Ego," demanding, as the condition of all knowledge, that experience be made coherent and intelligible. It is we ourselves, therefore, who carry into the stream of

¹⁶ Op. cit., p. 411.

¹⁷ Ibid, p. 465.

phenomena we call nature that order and regularity not inherent in them. Yet, because natural phenomena are given to us independent of all *a priori* forms of thought, the key to the comprehension of them must be sought, not in our own understanding, but in external events and things. For this reason natural science contains "an infinity of conjectures with regard to which certainty can never be expected. . . ." ¹⁸ In many instances the key to the understanding of natural events cannot be found at all. Only in the science of mathematics can there be complete universality and necessity because this science alone is not dependent upon variable sense phenomena for its content.

Within the confines of experience, then, man is a prisoner fast bound. Although it be of the very essence of human reason to subsume the manifold of this experience under the all-embracing ideas of freedom, the intelligible universe and God, let man beware lest he regard these notions as capable of enlarging the domain of knowledge. The "proud name of Ontology," as the science which claims to furnish *a priori* knowledge of *noumena*, or things-in-themselves, "must be replaced by the more modest name of a mere Analytic of the pure understanding." ¹⁹ Thus Kant has rescued knowledge from its low estate only to limit its domain to the world of appearances. The dualism of man and nature is paralleled by the dualism of sense-perception and understanding. This price, nevertheless, Kant cheerfully pays in order that he may not be swept off his feet into the maze of subjective idealism.

But, unlike the empiricist, Kant is by no means prepared to deny those concepts which transcend the sphere of intuitive knowledge. Those guarantees which he denies to theoretical reason he freely concedes to the practical reason. It is of the very nature of man's practical reason to be determined to action by a moral law in no sense dependent upon empirical conditions. Free from all determination by objects of desire, this principle is the mere form of a universal law. This law Kant states as follows: "Act so that the maxims of your will may be in harmony with a universal system of laws." ²⁰ It is clear that

¹⁸ Op. cit., p. 418.

¹⁹ Ibid, p. 215.

²⁰ Critique of Practical Reason, Watson ed., p. 268.

such a principle is empty of all empirical content, hence it is independent of all natural necessity. A will determined by such a self-imposed law is therefore free. Now since will is always the cause of effects in the phenomenal world, a free will is a *free causality*. Man, therefore, in his practical reason is a free cause or a *noumenon*. Thus the existence of the moral law, as a fact needing no deduction, leads inevitably to the conception of freedom which it guarantees by its own existence.

But Kant is further concerned to show that the moral law is no merely subjective principle but has objective validity of a practical kind. This cannot be doubted since the moral law gives to sensuous nature "the form of an intelligible world or *supersensible nature* without in any way interfering with the mechanism of the world of sense."²¹ In other words, as a sensuous being man is subject to empirically conditioned laws; and this is heteronomy. But reason makes us conscious of a law to which all our maxims are subject, as if an ordered system of nature must be produced by our will. This law must be therefore "the idea of a system of nature which is not presented in experience but which yet is possible through freedom: a supersensible world to which we ascribe objective reality, at least in relation to action, because we regard it as the object which as pure rational beings we ought to will."²² Thus practical reason adds certainty to the problematic ideas of speculative reason concerning freedom and an intelligible world, although this certainty holds good only in the sphere of action.

In the second "Critique," then, Kant restores to man those practical ideas so essential to the moral life. In his will, only, man is autonomous,—a free cause and therefore a noumenon. But the gap between man as free causality and nature as determined by mechanical laws yawns as widely as before; while the dualism in man's own nature between reason and faith is glaringly apparent. This gap Kant attempts to bridge in the "Critique of the Judgment." He defines judgment as the faculty of thinking the particular under the universal. Like understanding and reason, this faculty has its own *a priori* principle which, because of the unifying character of judgment, Kant

²¹ Op. cit., p. 273.

²² Ibid, p. 275.

asserts is the idea that all nature is purposive. Such an *a priori* principle "mediates between nature and freedom, and makes possible the transition from the conception of conformity to law to the conception of an ultimate end."²³ Thus the judgment bridges the chasm between the theoretical and the practical reason by the *a priori* principle that nature is shot through and through with purpose.

Yet Kant acknowledges that wherever the idea of mechanical causation can operate it should always be used as a principle of explanation. But in the case of organized bodies he feels that such a principle is quite inadequate to explain the facts. The blade of grass or the human body cannot be known in experience, even as an effect, without certain presuppositions of reason. Each of these is comprehended under an *idea* which determines all its parts. Moreover those parts of the organism which unite to form the whole are reciprocally cause and effect of each other's structure and function. "In such a body, accordingly, the conjunction of efficient causes is at the same time regarded as an effect through final causes."²⁴ Therefore organized bodies are "natural ends." Yet this is not the same as saying that they are ends of nature. Although the conception of a natural end "necessarily leads to the idea of the whole of nature as a system of ends"²⁵ pointing to an ultimate end, yet such a principle belongs not to the determinant but to the reflective judgment. While not interfering with the law of mechanical causality, such a principle supplies us with a guiding idea (i. e. of a final cause) by means of which our knowledge of nature may be extended.

Now since judgment may start from understanding or from reason, it produces two maxims which seem at first to be contradictory. The first asserts that all "production of material things . . . must be judged to be possible according to purely mechanical laws." The second maintains that "some products of material nature cannot be judged to be possible according to purely mechanical laws, but require quite a different law of causality, namely that of final cause."²⁶ But Kant is not baffled

²³ Critique of the Judgment, Watson ed., p. 321.

²⁴ Op. cit., p. 328.

²⁵ Ibid, p. 330.

²⁶ Ibid, p. 332.

by this apparent opposition. To say that all natural products must be *judged* to be possible on grounds of natural necessity is not to assert that they are possible *only* in this way. It is at least possible to regard the material world as a mere phenomenon and to think of its unknown substrate as a noumenon. Accordingly we may apply mechanical laws in explanation of whatever is necessary in the sensuous world, while we apply teleological laws to explain those peculiar natural forms which we must view as objects of reason. Nature may then be judged on two different principles which yet may not conflict. Their apparent opposition may be due to the nature of our knowledge. In judging of the possibility of any organism the teleological connection of cause and effect is indispensable. But the reason for this point of view cannot be found in the substrate of reality in nature since this must forever remain unknown. Therefore "we are compelled by the constitution of our intellectual faculty to seek for the supreme ground of teleological connections in an original Intelligence which is the cause of the world."²⁷

When the Kantian philosophy had slowly found its way into the comprehension and appreciation of thoughtful minds there appeared a profound dissatisfaction with its inherent dualisms and contradictions. These could all be traced back in the last analysis to Kant's obstinate retention of a shadowy Thing-in-itself which reason could only postulate but never know. If consciousness be essentially a constructive activity why is it not possible to conceive of this original energy as absolute, i. e. as creating its own material as well as prescribing its own forms? Thought would then reveal the same unity as art, and all division and externality would vanish from the inner consciousness. Once more there appears in thought-life the same yearning for systematic, comprehensive unity that characterized the system-builders of the seventeenth century. But the centre of gravity has shifted from the external world to the self. Kant has, indeed, effected a "Copernican revolution" in philosophy, whereby a thinking, experiencing ego has become the centre of the phenomenal world which is dependent upon it. The prevailing desire to annihilate the Kantian dualism in an all-embracing

²⁷ Op. cit., p. 343.

unity of self is furthered alike by poetry and by science. This is the golden age of German literature, and in the poems of Goethe and Herder are presentiments of the inner unity of nature and man. Likewise new views of the material world are clearly suggested by the development of the science of comparative anatomy and by the beginnings of modern chemistry. Thus literature, science and the deep-seated human impulse to unify all phenomena lead the post-Kantian philosophers into the inner recesses of the territory of idealism.

Fichte is the initiator of the movement. The method of exposition adopted by him is the opposite of the Kantian method. Whereas Kant had started with the multiform objects of consciousness and had finally worked back to the unity of the transcendental ego, Fichte begins with the primitive activity of the self and seeks to deduce from it the multiplicity of sensuous experience. Reflection and introspection alike reveal the ego as essentially an activity. Therefore, argues Fichte, there can be nothing in consciousness which is not the product of that activity, even though the self be quite unconscious of having produced many things in its experience. The empirical self is always limited by a not-self, i. e. by a world of objects, which it has not brought into existence. Hence it points to an active principle in conscious life which is unlimited and comprehensive. This principle Fichte calls the pure, absolute ego. He conceives it as the true source of those objects which are opposed to the finite self as limits and obstacles to be overcome.²⁸ For we can think both of self and of not-self, but we can think the latter only by means of the activity of the ego. By keeping a firm hold upon the idea of a free activity, in which the duality of subject and object has no existence, this primitive organizing power becomes a reality to us and we are led to reject the assumption of a separate soul distinct from the body.

Between self and objects is mutual interaction. Involuntarily the activity of the ego is carried over into the so-called external world whenever its parts are thought of as mutually dependent. Hence arises the notion of mechanical causation in nature.²⁹ Thus our conception of the universe as an interrelated whole

²⁸ *Wissenschaftslehre*, Bonn ed., 1834, pp. 216, 217.

²⁹ *Ibid*, p. 285.

is the product of a creative activity of which we are ourselves unconscious. As we project various sense-qualities into objects, so we project time, space and causality into nature. But it should not then be taken for granted that nature is not real. The active principle which produces an external world in the consciousness of every human being has genuine reality. Moreover it acts in conformity to a necessary law of its own nature in producing the same "world-picture" in each ego.

At this point the question naturally arises: Why does the ego present to itself an external world at all? Fichte replies that this problem can be solved only by recourse to the moral nature of man. If conscience is trustworthy and if labor and striving are essential to the noblest life, then we can understand the necessity of a finite, limiting world. For without resistance labor would cease to be; and without means ideals could never be realized. Nature, then, furnishes the conditions and the material of the moral life.⁸⁰ The primitive activity of the ego is expressed not alone in conscience but in the natural instincts of mankind; and the external world provides the means of satisfaction for both the higher and the lower impulses. Because these impulses are in constant search for means of expression, a world of objects and an organized system of ideas are developed within us. It follows that from the very first our view of the world is pragmatic. The satisfaction of natural instincts by means of objects leads to pleasure, and through pleasure we are made dependent on the objects that secure it. But it is possible for humanity to become conscious of ideal values which transcend the immediate and the transitory. Reflection reveals to us the slavery of dependence upon things and the possibility of spiritual freedom through the subordination of things to moral ideas. But Fichte does not regard natural impulse and desire for freedom as essentially in conflict. Indeed he rather asserts that natural desires may be satisfied in such wise that they serve as stepping stones to moral freedom. Thus the absolute ego may be realized in part in this finite world of sense and desire. The ultimate goal of complete, spiritual freedom is infinitely remote, yet man may continually draw nearer to it. Those natures in whom moral aspiration far

⁸⁰ *Wissenschaftslehre*, p. 312.

exceeds in intensity all natural desire, are the guiding spirits of the race, who arouse in inferior souls that passion for moral worth which animates themselves. Therefore man should live in close association with his fellows; only in this way can he become truly man. Self-realization is the moral ideal; yet each individual should develop his personality to the utmost only as a means of bringing about the highest good, which is the attainment of self-dependence and reason by the entire community. The ego, then, is, after all, only a tool to assist in the great work of the realization of moral freedom on the part of every human being.

Fichte's view of the self as attaining freedom through the conquest of obstacles projected by its own inherent activity leads him to maintain that control of all productive industry should be in the hands of the state. Then only is it possible to assure to every man that opportunity for labor and effort by which his spiritual emancipation may be achieved. It is clear, then, that this intense individualist was also the forerunner of modern socialism; albeit his purpose in so conceiving the functions of the state was far removed from that of the socialistic school of the present.

What is, then, the bearing of Fichte's thought upon the whole question of the mind and the material world in their reciprocal relations? By his annihilation of Kant's "Ding-an-sich," Fichte makes man the creator of a nature that he is ultimately destined to subdue and to hold in subjection to ideal ends. Humanity and its moral realization fix the limits of reality. Everything external is swallowed up in the projecting and organizing activity of the ego. Human experience comprises not only the whole of which we can have certain knowledge but the totality of being. Nature, with its system of forces acting under laws, is purely the product of the self, which transfers its own activity into the phenomena it has projected and organizes them according to the principles inherent in itself. Truly the apotheosis of human nature can go no further, since it is now made to comprehend both the external world and a God to be realized in the future by its own striving with material nature.

In the thought of Schelling is sounded a protest against the subjectivity of Fichte's nature-philosophy. Although Schelling

shows an unmistakable tendency to work out his conclusions by means of symbolism and analogy rather to follow in the steps of the great critical philosophers, he yet sees clearly that nature is worthy of more positive recognition than is accorded it by Fichte. In his view neither nature nor the human spirit can be understood so long as they are regarded as alien. Only when nature is conceived as containing both matter and spirit, merged in an absolute underlying unity, does it become comprehensible to man. The natural scientist accepts the world as a reality immediately given and then attempts to explain all its forms and events in terms of matter and motion in mechanical interaction.⁸¹ In the view of Schelling such an explanation ignores the apparent purposiveness of nature and leaves no room for the ideal element of experience. Science does not concern itself with that which must be the central problem of philosophy, namely, how can a system like that of nature arise in consciousness? In other words, how can nature generate sensibility and self-consciousness in any of its parts in such wise that it becomes an object to itself? This spiritual aspect of reality is comprehensible only if there be forces operating in nature quite other than those of mechanical action and reaction.

Schelling's solution of this crucial problem is as follows. At the heart of nature is a force which expresses itself throughout the world in the duality of subject and object. Since conscious life, revealing this dualism as its essential character, develops out of nature, then nature must exhibit the same opposition. "Nature is visible spirit, spirit is invisible nature."⁸² In matter the spiritual element is slumbering; in spirit matter is in process of realization. Starting from the spiritual forces as revealed in man, Schelling conceives of these forces as working throughout the whole of nature at lower powers. By reducing objects to their lowest powers we can take our departure from them and trace the stages by which nature has mounted to its completion in spirit.⁸³ To be sure Schelling by no means makes

⁸¹ Ideen zu einer Philosophie der Natur; Sämmtliche Werke, II, pp 4-30.

⁸² Ideen, II, p. 56.

⁸³ Über den wahren Begriff der Naturphilosophie, Sämmtliche Werke, IV, P. 85. Also Erster Entwurf eines Systems der Naturphilosophie, IV, 53-55.

clear how the construction is to be accomplished. Indeed he plainly distrusts the method of the naturalist who is satisfied with explaining nature as he sees it and who seeks for no symbolic meaning behind its phenomena. With an audacity almost sublime, this philosopher of Romanticism offers his nature symbolism as a substitute for the painstaking efforts of science to explain natural events by the laws of reciprocal interaction. Nor does he make any serious attempt to verify his speculative theory by reference to experience. Having formulated it, he attempts to show without objective proof that at every stage of nature each "power" reveals the polarity so characteristic of consciousness. In nature the objective pole is uppermost; in man the subjective is in control. Such a theory of orderly gradations in nature might well suggest that Schelling was groping toward an evolutionary view of the development of organic life. But such is not the case. As Höffding has pointed out,²⁴ Schelling's view not only belittles the theory of mechanical interconnection but also denies that there is an actual transition from one "power" to the next. The absolute unity underlying nature attains completion by means of a series of forms; but each form arises from the original productive force, not from other forms of its infinite process of realization. Such a nature-theory became current among scientific men during the closing years of the eighteenth century. It had the advantage of furnishing an explanation of the undeniable similarity among natural phenomena without recourse to the theory of actual progression of higher from lower forms.

In his maturer years, Schelling turned his thought from nature to human life. As he himself tells us, he "had learned to see that religion, public faith, civil life is the point on which everything turns."²⁵ In a later work ("Philosophie und Religion") he admits that nature and history reveal forces too antagonistic to be capable of deduction from the idea of *absolute* unity. Although a *living* unity contains contradictions within itself, this opposition must be reconciled during the course of natural and social development. Clearly Schelling has come to recognize the uncontrolled and irrational principle in ex-

²⁴ Hist. of Modern Philos., II, pp. 168, 169.

²⁵ Aus Schelling's Leben, II, p. 78.

istence which claimed the attention of Aristotle. But he asserts that the discord it produces is necessary to life and to harmony itself. God as a personal being can be comprehended only if we assume a recalcitrant principle within his own nature which is gradually harmonized in the course of the life development of the Supreme Being. Likewise the personality of man unfolds only in conflict with opposing forces outside himself. Indeed Schelling is inclined to believe that nature will always reveal an undisciplined residuum—a survival of a primitive chaos. But this irrational element has its function, since without the struggle it provokes no real unity is possible.

In his revolt against Fichte's subjective and negative view of the external world Schelling strives to endow nature with objective and positive reality. But in so doing he proves himself a true member of the Romantic school. Humanist as he is, he naïvely analyzes human consciousness, selects its characteristic duality, and, by the method of analogy, confers this upon nature. Thus he turns his back upon the painstaking methods of critical philosophy in his desire to prove nature in no sense alien to man. In his later views Schelling sets up harmony—a purely human concept—as the goal of being, and conceives of nature and the social experience of mankind as one long process of reconciliation of spirit with the refractory element of existence. In method and in spirit he proves himself far removed from the drab-colored laborers in the field of natural science.

The sharp antithesis made by Kant and Fichte between the ideal striven toward by humanity and the real as presented in nature is still drawn in some degree by Schelling. But with Hegel the ideal is reconciled with reality, since it is made the living principle at the heart of things. Unlike Fichte and Schelling, Hegel had a genuine interest in the objective phases of existence and made an extensive study of natural science and of history during his student days at Tübingen. His interest however, in great natural and social forces was purely for the purpose of explaining them in terms of the ideal and spiritual. He eagerly turns over the pages of history in order to discover in later ages that vital spiritual energy that animated the thoughts and acts of men in the great epochs of Greece and Rome. This becomes the dominant purpose of all his thought,—to lay bare the ideal, working at the core of existence, and to develop in

systematic form the operations of this spiritual force. The dualism of the critical philosophers offended his sense of the unity of all life no less than the unsystematic methods and results of Schelling repelled his instinct for thoroughness and organization. Accordingly he sets up as his supreme task to show *how*, by inner necessity, the different elements of existence are translated into one another. In his view the Absolute is spiritual life passing with infinite patience through the multi-form phases of nature and of history in order to develop in each all the content of which it is capable.³⁶

Despite Hegel's knowledge of natural science and his assertion that nature must be understood as it is, not as philosophy chooses to conceive it, he yet attempts to discover the truths of nature by the method of dialectic. No more than Schelling does he make use of the exact methods of empirical investigation. This is due to the fact that Hegel assumes a parallelism between methods of thought and processes of existence.³⁷ Each limited concept tends to pass over into its opposite and both are negated only to issue in a unity. For example, the abstract concept of pure being passes over into not-being and the unity of the two is expressed in the concept of becoming which is neither being nor not-being.³⁸ In the same way every finite thing in existence points beyond itself and becomes part of a great upward movement. Nature reveals two great principles: (1) the passing over of opposites into one another and their transformation into new forms,³⁹ and (2) the conservation of all the energies and worths of existence. To be sure the acorn must perish if the oak is to come into being; but in the oak is treasured up all the essence of the seed. Nothing essential and valuable is ever lost from nature or from human life. To separate the ideal sharply from the real is to run the risk of its vanishing from existence so that the golden ages of history could never be repeated. The world of nature like that of spirit is governed by general laws. Exhibited in abstract form in logic, these laws are expressed objectively in existence. Thus, like a true

³⁶ *Phänomenologie des Geistes*; Vorrede.

³⁷ *Encyclopädie der philosophischen Wissenschaften* (Bolland ed.), §§ 81, 84, 85, 138, 140.

³⁸ *Ibid.*, §§ 87-95.

³⁹ *Ibid.*, §§ 118-121, 150.

humanist, Hegel does not hesitate to abstract from human experience both its concepts of value and its methods of thinking and to interpret the manifold of the external world in terms of his own preferences.

As a result nature is conceived as climbing up, stage by stage, from mere objectivity to the inner life of spirit,—from mechanism through physics and chemism to spiritual life.⁴⁰ But, like Schelling, Hegel is loth to regard one grade of being as actually produced by another. Thus in his "Encyclopädie" he states that one stage results from another "*aber nicht so, dass die eine aus der anderen 'natürlich' erzeugt würde, sondern in der inneren, den Grund der Natur ausmachenden Idee.*"⁴¹ Indeed he goes so far as to characterize the notion of actual evolution of complex from simple organisms as ill-grounded and absurd. No more than Schelling is he prepared to accept a mechanical *Weltanschauung*.

In the third part of his systematized philosophy Hegel considers the manifestation of the Idea in the life of man.⁴² He traces its operations in mental life or psychology; in community life, where it manifests its inner workings in the history, institutions and ideals of society; and finally in art, religion and philosophy, where the Absolute, the totality of spiritual life, is most clearly revealed.⁴³ But although these last are life-forms of the world-spirit, yet since they appear to attain realization only in the sphere of the human, the spiritual life of man must be the highest plane of existence. Once more Hegel proves himself unable to rise above an anthropocentric view-point in his philosophy of nature. Indeed it is questionable whether any thinker can cast off all human predilections and interests when he comes to the investigation of some problematic aspect of his world. The most thorough-going believer in a mechanical nature uses his conviction as a method of controlling his environment in the furtherance of his own ends. In the apt phrase of Höffding, "No dialectic can teach us to jump off our own shadows."⁴⁴

⁴⁰ *Encyclopädie der philosophischen Wissenschaften* (Bolland ed.)

§§ 251, 252.

⁴¹ *Ibid.*, § 249.

⁴² *Ibid.*, §§ 388, 389.

⁴³ *Ibid.*, §§ 553-577.

⁴⁴ *Ibid.*, p. 185.

Hegel's humanism is social rather than individualistic. Only in community life can man realize his powers and become truly man. At times Hegel subordinates the individual wholly to the moral order which works through him. The state, taking up into itself that which is most valuable in family and civic life, represents the "progression of God in the world" far more perfectly than nature ever can. Thus Hegel is led to regard the state as an institution almost divine and to ignore certain grave defects in the then existing order. Between 1820 and 1831, when his country was passing through a period of clerical reaction and of neglected political promises, he continues to maintain that the existing conditions exemplify the living Idea. Humanism, starting as it does from personal preference, is far more liable to fall into this species of error than its opponent naturalism which makes the ascertainable facts of the situation the point of departure of its speculative reconstructions.

The thought of Schleiermacher is suggestive from the standpoint of our problem chiefly because it asserts the ultimate goal of all knowing or acting to be the unity of thought and being. In nature being has the upper hand and its science is physics. In the life of man reason is uppermost and its supreme science is ethics. But even in nature a lower form of ethics is exhibited; for the will is here revealed as advancing from the inorganic to the organic sphere and attaining its highest development in man. Because of his absorbing interest in ethics Schleiermacher seeks to unify it with the natural sciences; for he feels that without this harmony between nature and human ideals ethics would be impossible. Man's attempt to make himself the master of nature represents the shaping and organizing aspect of the ethical powers. To this phase belongs the development of property, of industry and of organized society. But the ethical process is also expressed in a symbolizing activity, by means of which man stamps his inner spiritual life upon the world. Schleiermacher is sincerely optimistic regarding the final unity of nature and reason. Yet at times he is led to deplore the apparent supremacy of the organizing activity, relatively materialistic as it is, over the symbolizing activity of the moral process. The harmony of the natural and the ideal is not yet!

Schopenhauer is a unique figure in the philosophic movement of his age, for he boldly rejects the presupposition of the harmony

of nature and human life. The pain and struggle of existence appeal profoundly to his pessimistic spirit and impel him to assert that the innermost essence of existence is uncontrolled, unresting desire. Although he freely accepts Kant's position that we cannot know things as they are in reality, yet he denies that the true nature of existence must therefore remain forever incomprehensible. In the nature of man himself, in his feeling and striving, is the clue to the understanding of all nature. If we approach the external world with this illuminating conception we shall find that will and desire are its inmost principles. Throughout all stages of existence the blind impulse to live is present; and at the plane of human life intelligence is developed to work in the interests of this restless striving.

In one of his best-known works, "*Der Wille in der Natur*," Schopenhauer attempts to work out a cosmology on the basis of his fundamental postulate. The world as it exists for a knowing being is idea. But this is merely the external aspect of reality. When we seek the hidden ground of all phenomenal appearances we must look within ourselves. As will is the essence of man so must it be the essence of nature. Otherwise the world will remain an enigma to mankind. It is clear that Schopenhauer did not subject to critical examination his naïve assumption that the principle nearest and most vital to man is the kernel of existence. But he did concede that the will itself might be a phenomenon, since acts of will are the outcome of motivation, which Schopenhauer held to be one of the forms of the causal law. However he promptly adds that if such be the case, at least the will is only one step removed from reality; it is the thing-in-itself but thinly veiled. As the human body is the external aspect of will, so is material nature the visible form of the same active principle revealing itself as natural force. The processes of attraction, chemical change and organic growth differ from deliberate action only in degree, not in kind. On the plane of mechanism, cause and effect can be clearly traced; but the causal relation is less evident at the stage of organic life. In the human sphere mechanical cause has become reasonable motive and the effects it produces are infinitely complex and difficult to unravel. The restless, painful striving for life, which is the essence of existence, appears most plainly among human

beings. With consciousness comes realization of the misery of existence, driven onward by the goad of unceasing desire.

It will be seen that Schopenhauer's philosophy of nature leads him to a conclusion totally opposed to that of his contemporaries of the Romantic school. However, he attempts a reconciliation of the endless conflict of nature and of human life in his views of art and of asceticism. In artistic feeling the restless soul finds peace, albeit this is but momentary. Only in complete resignation, in entire negation of the will to live, is there surcease of pain and a lasting calm. And this blessed quiescence has been attained only by the great saints and ascetics of history. The common run of mankind reach no such peaceful Nirvana. The pessimism of Schopenhauer did good service in driving home into the minds of men the bitter fact of the existence of evil. No longer could this be lightly passed over by philosophic optimists. Its reality must be recognized and explained in any satisfying theory of the world.

It will be seen that the answer furnished by German thought to the world-riddle of nature and man in their reciprocal relations differed widely from that worked out in France. While French thought inclined strongly to naturalism and furnished too ready solutions of a complicated problem, the German mind plunged into the depths of human experience and emerged with the exalted conviction that the world is comprehensible only in terms of the spiritual principle in man. To the deeper insight of the German philosophers, French world-views appeared shallow since they gave no explanation of the nature of experience itself, but naïvely assumed an external world from which man has been mechanically evolved. Yet the dominant humanistic bias of German thought led its leaders into errors no less harmful than those of the French naturalists. Kant alone, as the master-mind of his age, was conscious of the mistake involved in reading nature in terms of human preference and purpose. But his caution resulted in the inherent dualisms of his thought-system. Then came Fichte and boldly took the plunge that Kant had carefully avoided. The whole universe is now neatly packed away in the Ego itself; and nature is made a purely negative thing, a self-produced obstacle necessary to the moral development of

man. Schelling likewise stands within the circle of his own shadow and, while he insists on the independent reality of nature, yet he interprets his world as the manifestation of a single spiritual principle polarizing itself as subject and object. Again Hegel perpetuates the tendency to explain the whole of nature by reference to its latest, and in his view, highest product. Science had not then developed to the point where man could get outside himself and survey nature with an impartial and objective gaze to which the first and the last, the origin and the product, rest on a common plane as facts—not values. Hence, objective as are his interests, Hegel is a supreme humanist. Schopenhauer rounds out the long list of intellectual giants with his humanistic conception of the world, as the outward manifestation of the inward striving to live. In him the evolutionary view of nature finds an early herald. Furthermore Schopenhauer must be ranked with a small, but increasing body of thinkers who maintain that the unlimited perfectibility of man is impossible so long as he follows nature. To this conclusion he is led, however, not by a scientific investigation of the world and the mind of man in their actions and reactions but by his inner consciousness of the struggle and the suffering of human life.

Thus, at the end of the first half of the nineteenth century, the thoughtful individual of philosophic bent is free to choose one of these two opposing solutions of naturalism and humanism. He may ally himself with the French school and maintain a purely mechanical world-view which regards man as himself a complicated mechanism wholly dependent on environment for all that he is and can be. Or he may join hands with the idealists and seek the key which will unlock the meaning of nature within his own breast. Faulty and incomplete as the first view now appears, it yet is far more in accord with the spirit and procedure of modern science than the latter. With the enormous expansion of scientific knowledge and control during the past century, the speculative world-systems of the Kantian and Romantic schools seem doomed to a not far-distant dissolution. Indeed so brilliant a thinker as Professor William James has been led by his appreciation of the errors of idealism to express the desire that modern philosophy "might have gone

around Kant rather than through him." But such was not to be; and it is doubtful if the world would have been better off had such a course been possible. For only when a profound and sincere theory of experience has been worked out to its extreme conclusions, can thought discover the faults inherent in it and, taking unto itself the best of the old, strike out into fresh paths of discovery which will enlarge the boundaries of tested knowledge.

CHAPTER IV

THE CONFLICT OF NATURALISM AND HUMANISM IN THE NINETEENTH CENTURY

Before the wave of Romanticism had risen to its crest in Germany, another thought-movement had gained headway in France which was destined soon to determine the trend of English speculation. While the Romantic school tended to overlook the diversities and oppositions in the vast whole of nature and to minimize, if not to deny, the mechanical operation of natural laws, the new school of positivism took careful note of both these facts in working out a new *Weltanschauung*. Unlike the German idealists, who interpreted the universe in accordance with a principle derived from their own consciousness, the French positivists took their start from the facts of nature which had stood the test of repeated observation and experiment. Thus the subjective method of the former is set in strong contrast with the objective method of the latter. The one started from the unity of reason or of will and sought to establish the application of its chosen principle to the manifold of sense experience; while the other took its departure from the multiplicity of phenomena and rose, step by step, from the more particular to the more general principles in search of an all-embracing law of unity. Yet these two movements were not wholly alien in sympathy. Both were animated by the same conviction that the existing world is the outcome of forces working for long ages past in the spheres of nature and of intelligence; and that "the present is big with the future." Both felt that only by a thorough understanding of the conditions and forces of the past could the present be moulded in accordance with human purposes.

Positivism received its original impetus from the enormous expansion of science in the latter half the eighteenth century and the first decades of the nineteenth. This expansion was

most notable in the fields of chemistry and biology. Owing to the continuous experimentation of Priestley, Lavoisier, Dalton, Wöhler and others, the gases composing air and water had been discovered, the theory of the chemical atom elaborated, and plant and animal organisms proved to be "chemical laboratories in which conditions are peculiarly favorable for building up complex compounds of a few familiar elements, under the operation of universal chemical laws. The chimera 'vital force' could no longer gain recognition in the domain of chemistry."¹ Equally brilliant results were recorded in the development of biology and physiology. The chemistry of digestion and respiration in both plants and animals was established through the researches of Spollanzani, Hunter and Erasmus Darwin; the classification of the animal kingdom and the proof of the adaptation of all parts of the animal organism to one another were the great contributions of Cuvier; and valuable facts concerning cell structure were furnished by the Germans Schleiden and Schwann. Thus in the first half of the nineteenth century an imposing body of scientific knowledge was rapidly accumulating, and the domain of science was being continuously cut up into fields of specialized research. The whole positivistic movement was a protest against the point of view that only scientific specialists can profit largely from the advance of science. On the contrary the positivists urged that the conquest of nature should result in the complete reconstruction of the conditions of human life, both material and spiritual. [In no uncertain utterance they proclaimed that the time was ripe for the utilization of scientific knowledge in the development of a wholly new conception of human faith and conduct. Starting from the approved facts and laws of positive science, let man reconstruct his world-scheme on a new basis and from a point of view too frequently ignored—that of the well-being of humanity.]

As the high priest of positivism, Auguste Comte offers a fresh solution of the riddle of man and nature. Like Immanuel Kant, Comte belongs to an age of transition; he stands between the old order and the new, sharing in the ideas of both. In his view, as in that of the great German, morality and social well-being are the ends of supreme human importance, to which all

¹ Williams, *History of Science*, IV, pp. 54, 55.

theoretical interests and investigations should be subordinated. As Caird has pointed out,² Comte was enabled, because of the period of social unrest in which he lived and because of his sensitive social sympathies, to give his readers such insight into the corruptness and the needs of society as could not be looked for from Kant. There can be no doubt that Comte was acquainted, albeit somewhat superficially, with the critical philosophy of the Königsberg sage. He accepts without question the dualism between experience and reality, sense perceptions and understanding, so fundamental in the system of Kant. But he goes further than his predecessor. No "ideas of pure reason," beckoning the thought of man to the consideration of a possible realm of reality transcending that of sense, are given respectful recognition by Comte. If such ideas exist they must be rigidly suppressed or made wholly subservient to the facts of science. By the necessary limitations of our intelligence we are forever shut out from a knowledge of ultimate reality and from any "absolute" view of existence. The riddle of the universe can be no further solved than is needful for the progress of humanity.³ While Comte thus insists that we can know only phenomena, he clearly implies that there is a realm of reality beyond the flux of appearances. But no "objective synthesis" of this reality is possible in the nature of the case. Let man content himself, therefore, with a "subjective synthesis"; i. e. let him regard all the objects and forces of nature solely in relation to human wants and ideals. This conception lies at the basis of the entire Comtian philosophy. The individual is to view the universe from the standpoint of its use in furthering his life. But Comte's gospel is no selfish individualism; for he regards each human being as vitally related to his race. The progress of biological science gave to Comte, as to Herbert Spencer, the conception of an organism as a living whole of interrelated parts, each sustaining and being sustained by the vital functions of all the others.⁴ This notion they both apply to human society, with the result that the individual is no longer conceived as the independent atom of Rousseau's early theory. Rather is it held that every personality owes its existence to the moulding influences

² Caird, *The Social Philosophy of Comte*, p. 209.

³ Comte, *Positive Philosophy*, trans. by Harriet Martineau, I, pp. 4-6.

⁴ *Ibid*, pp. 224, 225.

of unnumbered generations which have passed away leaving their free gifts to the vast social heritage of institutions, knowledge and ideals. Thus "the whirligig of time brings in its revenges," and the error of pure individualism, as worked out in the bloody days of the French Revolution, leads to a violent reaction in favor of social coöperation and even of individual subordination in the interests of the social organism as a whole.⁵

Strongly influenced as he was by the political theories of Saint Simon, Comte yet was repelled by the scheme of socialistic despotism to which they led. His problem was, then, the ancient one of maintaining a sound social organization while securing due scope for the development of individual taste and initiative. The solution of this problem he found, as had Condorcet before him, in the expansion of science with its accompanying contributions to the welfare and happiness of mankind. Indeed, in Comte's view, positive science is the true cause of all human progress.⁶ In the primitive state, men were held in the grip of two warring tendencies,—one impelling to sociality and the other to selfish egoism. The latter prevailed at first; yet it was recognized, even at that early stage of history, that the supremacy of the social instinct was necessary to human welfare. Therefore the tribal leaders worked out an explanation of the world which they vaguely felt would serve to strengthen the social bond. Thus arose what Comte terms the theological stage of human association.⁷ Natural events were referred to the direct agency of supernatural beings whose malignant caprices must be placated by ample sacrifice and ceremonial. But even here were the crude beginnings of positive science. The wills of the unseen beings who controlled nature were not always capricious and arbitrary. In some directions they acted with a regularity which gave birth to the notion of "natural law." Little by little the field controlled by law was extended and that given over to caprice was correspondingly diminished. Fetichism made way for polytheism and this in turn for monotheism.⁸ Each stage in the purification of the early crude theology, Comte views as a step forward toward

⁵ Comte, *Positive Philosophy*, trans. by Harriet Martineau, III, pp. 407, 408.

⁶ *Ibid.*, II, pp. 182-188.

⁷ *Ibid.*, II, p. 310 ff.

⁸ *Ibid.*, III, p. 33 ff, p. 82ff.

its final overthrow and the establishment of the undisputed sway of positive science. This conquest he asserts to have been hastened by the development of metaphysics. In the metaphysical stage all natural phenomena were referred, not to capricious beings, but to invisible essences or ideal forces lying behind them⁹—"the ghosts of vanished gods." The gain to positive science in the substitution of one form of transcendent explanation for another may not at first seem clear. But the advance was in reality in two directions. First, the essences behind phenomena were finally reduced to one vast abstraction—nature itself. Secondly, the critical spirit which metaphysics directed against theology was evidence of a growing sense of the prevalence of law in nature and human life. Thus it came about that, for a century or more after the Renaissance, science and philosophy were in friendly accord. But the history of intellectual progress since that time is the record of the sure and steady encroachment of science upon the territory claimed by metaphysics. As a result of the splendid achievements of Galileo and Newton, metaphysics was forced to abandon the sphere of inorganic nature; and with the development of biological science in the eighteenth and nineteenth centuries its supremacy over that important domain has been surrendered.¹⁰ Only in the realm of social phenomena does metaphysics still hold sway; but its purely critical and destructive tendency is amply evidenced, according to Comte, in the disastrous events of the French Revolution. The social structure can never be reorganized and made to serve human interests to the utmost until sociology has itself passed into the stage of a positive science.¹¹ This will come about only when the apparently conflicting interests of order and of progress are interpreted in harmony with those natural laws which regulate the lives of men.¹² The third and highest level in the upward march of humanity is the stage of positive science which has but recently been attained. Now at last does man see that neither supernatural beings nor metaphysical essences are adequate to explain the mighty drama of nature and humanity. Only in the laws of coexistence, succession and resemblance can he find

⁹ *Op. cit.*, II, p. 323 ff.

¹⁰ *Ibid.*, p. 245 ff.

¹¹ *Ibid.*, p. 16.

¹² *Ibid.*, p. 216.

an unflinching clue to the mystery of nature in its bearing upon the life of man.

Whereas Comte was fully alive to the need for specialization in the sciences, he yet felt keenly that they tended to lose themselves in a multiplicity of detail.¹³ Therefore he urged the organization of all branches of scientific knowledge and research around the synthetic principle of the advancement of human welfare. In this way social benevolence and scientific knowledge would act and react upon each other to the profound advantage of both. Thus, in the midst of a universe unknowable in its ultimate nature, human life might attain a certain unity and completeness. Although man could exert no control over vast areas of nature, yet the laws of his immediate environment and of his own nature could be discovered and utilized to bring about the greatest good that the scheme of things permits.

This brings us to a consideration of Comte's conception of nature in its relation to the purposes of man. It seems clear that he holds a far more pessimistic view of nature in the "Positive Philosophy" from that which he presents in his later work—the "Positive Polity." In the former, nature is conceived as a vast mechanism of things and forces in mutual interaction according to inflexible laws.¹⁴ As the domain of natural law is extended through the ages, man comes to conceive of nature as a grim necessity hemming him in on every side. But science itself in time teaches him to look upon the human race as a mighty living organism of which every individual is a part or member.¹⁵ Between the individual and the relentless machinery of nature stands the Deity of Comte—Humanity¹⁶—interposing its knowledge and skill to relieve the tremendous pressure of external fatality. Passed thus through the alembic of humanity, brute necessity is transmuted into something approaching providential activity. Physical, chemical and biological phenomena are continually modified by the generations of mankind and made to subserve human needs.¹⁷ And this knowledge and control are passed on to future ages and serve to ameliorate and

¹³ *Op. cit.*, I, p. 9.

¹⁴ *Ibid.*, pp. 213, 214.

¹⁵ *Ibid.*, III, pp. 407, 408.

¹⁶ *Système de Politique Positive*, I, p. 329 ff.

¹⁷ *Ibid.*, I, pp. 39-42.

advance the life of the race. In the words of one of Comte's most discriminating critics: "The life of the individual in any age is what it is, by reason of the whole progressive movement of humanity; and the later the time of his appearance the more he owes to his race."¹⁸ Man's existence as an object in nature has no intrinsic value. Only if he add his quota to the goodly heritage of science and skill which is to mould the lives of unborn generations can he be said to have justified his existence on this earth—to have contributed to "the 'subjective' existence of humanity."

But Comte is forced to acknowledge that humanity has no unlimited power over nature. Its activity is bounded everywhere by a brute force, indifferent to the well-being of man, which it can modify only in part. Since humanity has not created the materials which it employs, it must be forever limited by them. By obedience to those laws which he has not himself imposed upon the material world, and which he must therefore patiently discover, lies man's only hope of harnessing the mighty energies of nature to carry forward his designs. It is the law of the universe that the higher should subordinate itself to the lower. The inorganic sphere limits and controls the organic; and man must work out his destiny by a complete submission to all the various forms of necessity, physical, chemical and vital, by which he is surrounded. This is the price of his ultimate limited control. Poetry may paint in glowing imagery the picture of nature as the beneficent friend of man; but science knows full well that the arrangements of the universe in its various spheres are often far from favorable to human existence. Were it not for the long beneficent influence of humanity, the world would offer a harsh and inhospitable home to man. Comte has little sympathy with Condorcet's optimistic visions, which he criticises as "wanderings after an indefinite perfectibility, and chimerical and absurd anticipations."¹⁹ Although he unhesitatingly asserts that the amelioration of life proceeds *pari passu* with the development of positive science, he hastens to add that both are subject "to limits, general and special, which science will be found to prescribe. The chimerical notion of unlimited perfectibility is thus at once ex-

¹⁸ Caird, *op. cit.*, p. 25.

¹⁹ *Op. cit.*, II, p. 202.

cluded."²⁰ But within bounds the improvement of man's condition will go steadily forward as it has done in the past. Moreover Comte clearly maintains "the gradual and slow improvement of human nature" itself,—a theory which he bases upon Lamarck's view of "the influence of a homogeneous and continuous exercise in producing, in every animal organism, and especially in Man, an organic improvement, susceptible of being established in the race, after a sufficient persistence."²¹ To support this conclusion Comte calls attention to the "superior aptitude for mental combinations, independent of all culture, among highly civilized people"²² and the correspondingly "inferior aptitude" among savages,—a position which present-day anthropology and social psychology regard with considerable doubt.

But the attitude of cautious optimism revealed in Comte's earlier work is abandoned in the "Positive Polity." Here he maintains that the spur of physical necessity not only stimulates man's first efforts toward scientific knowledge, but that by means of this same sharp goad he learns to bring his original egoistic impulses under the discipline of daily labor in coöperation with his fellow-men. By a thorny road man has moved steadily toward the goal of social sympathy and helpfulness. His egoistic tendencies dominate his life, until he sees that he must first be a submissive servant of natural law if he would later be master, and that he must further the well-being of others if he would make them instrumental to his own.²³ Out of the submission of selfish caprice to natural and social laws, man slowly develops his intelligence and social sympathy until they control his lower impulses.²⁴ It is the splendid triumph of humanity that it has made the soulless fatality of nature, which seemingly condemned it to "brute egoism," the chief means of its rise to moral insight and power. The social sympathies, once in control, have an attractive power which draws man on in the path leading to the betterment of all mankind.²⁵ Because of extreme division of labor in our complex industrial system, each man works for the

²⁰ *Op. cit.*, pp. 232, 233.

²¹ *Ibid.*, p. 233.

²² *Ibid.*, p. 233.

²³ *Système de Politique Positive*, I, 27-33.

²⁴ *Ibid.*, pp. 15, 16.

²⁵ *Ibid.*, II, 699.

good of others, whether he will or no. But his moral emancipation comes when he consciously and willingly labors, alone or in coöperation with others, for the well-being of the community.

But Comte is not content with pointing out that the hostility of nature ultimately serves the highest good of man. He goes farther and indulges in a mystical tribute to the natural order in its own right. When we attain that point of view where man appears as the summation of natural forces, we learn to love nature as the groundwork of that social order established by humanity. By poetic license, then, man may be permitted to forget the bitter conflict he has waged with the world of material things, and instead to regard this world as existing to further his highest moral good. Indeed, in a sort of poetic rapture, Comte suggests that his followers add to their worship of the "Grand Être, Humanity, the adoration of Space as the "Grand Milieu" and of the Earth as the "Grand Fétiche." These last may be conceived as fervently longing for the advent and triumphant progress of Humanity. Thus, in the end, the mechanism of nature is no longer regarded by Comte as unfriendly to man but as a direct and conscious means of transmuting egoism into social benevolence—as a friend in the highest sense. In the words of Caird, "that optimism, which is rejected in the beginning as truth, is brought in at the end as poetry."²⁶ The dualism between nature and man seems here resolved in a moral unity. Moreover Comte's subjective synthesis, as his critics have pointed out, is not subjective at all, if by that term we refer to the sensations and feelings of a particular individual. His idea of humanity as an organic whole is an objective rather than a subjective principle of synthesis; and when the opposition between the material world and man is made to disappear by reason of their intrinsic moral correlativity, the dualism in Comte's world-view is in a high degree transcended.

Most significant for future social and philosophical speculation is Comte's attempt to bring the social life and historical development of man under the concept of natural law. The rapid spread of the scientific attitude toward all phenomena, natural or social, has frequently been pointed out as the characteristic feature of nineteenth century thought. Not only does natural science justify

²⁶ *Op. cit.*, p. 46.

its ways to man by its definiteness and certainty, but also by its vast utility in promoting the happiness and well-being of the race. Hence the tendency toward a purely mechanical *Weltanschauung* has gradually gained tremendous headway. To be sure the stream of positivism which took its rise in France received a set-back in Germany. Here, as we have seen, the attempt was made to show that the whole mechanical scheme of things is the phenomenal instrument of a purposeful spiritual Being. In England, likewise, although positivism exercised profound influence, it was by no means so daring in its ultimate conclusions as in France. English speculation confined itself more strictly within the limits laid out by Hume and Kant. Hence it took sides neither with an absolute idealism nor with an absolute materialism. With the sanity so characteristic of English thought, its philosophers maintained that even determinism is not absolute but is merely a hypothesis indispensable to science. Since experience can bring us in contact with but a small portion of this vast universe we are in no position to assert that mechanism everywhere prevails. Man must content himself with the relative truths of science and neither deny nor affirm the existence of absolute determinism. Let him proceed *as though* the mechanical interaction of phenomena were universal, *as though* the laws worked out by observation and experiment were changeless and eternal. So shall he substitute a useful positive science for an unfruitful metaphysics without being forced to deny the reality of an intelligent Providence.

As a result of this attitude, the English philosophers of the first half of the nineteenth century turned their attention to social and ethical problems. Political and religious interests were uppermost. Bentham and James Mill took what was most sound from the psychology and ethics of the previous century and applied it to current moral and social questions. In his well-known work, "Principles of Morals and Legislation," Bentham stated his principle of utility and attempted to show that its demands "are neither more nor less than the dictates of the most extensive and enlightened benevolence." With the utmost zeal this founder of the utilitarian school of ethics devoted his life to the reconstruction of the English constitution and the cause of legislative reform. Like Bentham, James Mill was a philanthropist in the best and broadest sense. His strong psycho-

logical bent led him to seek a foundation for Bentham's principle of utility in the laws of psychical life. Hence he made a systematic effort to explain all mental facts and processes by the theory of the association of ideas. The utility principle, thus firmly grounded in natural laws, was vigorously applied by Mill to the reform of various political and social evils. Thus a naturalistic humanism is the keynote of all his thought.

But the most significant and influential philosopher of the pre-evolutionary period in England was John Stuart Mill. In cordial agreement with Helvetius, he insistently proclaims that character and personality are the outcome of social environment and rational education. Hence human character is indefinitely modifiable by circumstances and training. As a leader of the empirical school of his day, Mill denies that knowledge can be extended by pure thought. Only by observation and induction can the body of truth be enlarged. Upon the possibility of bringing all hypotheses and opinions to the test of experience depends the advancement of humanity. Although Mill was not wholly successful in establishing his theory of pure empiricism, yet his method of bringing experimental and critical inquiry to bear upon a wide diversity of practical problems was of the utmost value in evoking a scientific and critical spirit in his contemporaries.

Mill's view of nature in its bearing upon the economic and moral progress of mankind is of interest not only because of his disagreement with the final position of Comte but also because his standpoint represents the most advanced views of English empiricists previous to the epoch-making work of Darwin. In his essay on "Nature" Mill defines this much misused and misunderstood term in two senses. First, nature may mean the "aggregate of the powers and properties of all things." In this sense it "is a name for the mode, partly known to us and partly unknown, in which all things take place."²⁷ Thus the term includes all phenomena produced by human agency no less than those we call spontaneous. In the second sense "nature" no longer signifies all which takes place in the inner and the outer world but all which happens without the agency of man. From this standpoint the natural is opposed to the artificial. With true humanistic interest Mill proceeds to show the significance of these

²⁷ Cf. *Three Essays on Religion*, (ed. 1874), p. 6.

concepts for human conduct. Man can take advantage only of the properties he finds in the world. He may move objects and bring them into contact, thus calling into action natural forces hitherto dormant. But "the volition which designs, the intelligence which combines, and the muscular force which executes these movements, are themselves powers of nature."²⁸ Now in ethical theory there seems to appear a third meaning of nature. Here the term stands for what ought to be as opposed to what is. People are bidden to "follow Nature" as a trusty guide whose unerring rectitude is set in noble contrast to the caprice and injustice of human law and morality. But how is it possible, argues Mill, for an individual to do anything else than "follow Nature" since all his thoughts and acts are under the dominion of natural laws? To be sure man can use one law to counteract another; in this way he may place himself under one set of natural laws rather than another. "If, therefore, the useless precept to follow nature were changed into a precept to study nature; to know and take heed of the properties of the things we have to deal with, so far as these properties are capable of forwarding or obstructing any given purpose; we should have arrived at the first principle of all intelligent action itself."²⁹ This, then, is the essential difference between wise and foolish conduct,—to apply intelligence to the regulation of those forces which in any event we must obey.

But since the dictum to "follow Nature" is used not only as a prudential but as an ethical precept, it behooves us to examine "nature" in the second sense, i.e., as the spontaneous course of events and processes not directed by the agency of man. Here, as Mill is at some pains to point out, the maxim is not only superfluous but is also "absurd and contradictory." For is not the end and aim of human action to alter and improve nature in the sense of the natural course of things? If the artificial be not better than the natural why do all the Arts exist? Why drain noxious swamps, apply improved methods of agriculture, utilize electricity and steam in a hundred ways? Here nature is conquered—not submitted to. Indeed it may truly be said that all praise of art and civilization "is so much dispraise of Nature; an admission of imperfection which it is man's business

²⁸ Op. cit., p. 8.

²⁹ Ibid, p. 17.

and merit, to be always endeavoring to correct or mitigate."⁸⁰ But the consciousness of this truth has caused all new and striking attempts at improvement to fall under the suspicion of the established religious bodies. This was especially true in the Middle Ages. But even now there exists a vague notion that although it is proper enough to bring certain natural phenomena under man's control yet the general scheme of nature is a model for us to imitate. Nature's ways are God's ways and as such are sublime and perfect. This doctrine, in the opinion of Mill, has led to fundamental errors. He points out with relentless wealth of detail how the vast cosmic forces show an absolute recklessness of human life and happiness. Flood and famine, fire and pestilence devastate the fairest and the most populated portions of the earth with complete disregard of the welfare of humanity. If, then, the physical government of the world permits of things "which, when done by men are deemed the greatest enormities, it cannot be religious or moral in us to guide our actions by the analogy of the course of nature."⁸¹ It follows that not even "on the most distorted and contracted theory of good which ever was framed by religious or philosophical fanaticism, can the government of Nature be made to resemble the work of a being at once good and omnipotent."⁸² But Mill's last word is not one of atheism or even of agnosticism. He concludes that the "Principle of Good" is not all-powerful and therefore He cannot at once subdue the powers of evil either physical or moral. He has placed mankind in a world demanding incessant struggle but has at the same time made them capable of carrying on the fight with energy and with continuously increasing success. Thus man is God's auxiliary in the conflict with the blind forces of a recalcitrant nature. And the duty of man is the same with respect to his own nature as to the world, namely, "not to follow but to amend it."⁸³

It is impossible to deduce from Mill's essay any conception, adequate or inadequate, of the theory of the gradual transmutation of life-forms which was debated in his own age and was soon to receive such splendid verification in the publication of the

⁸⁰ *Op. cit.*, p. 21.

⁸¹ *Ibid.*, p. 31.

⁸² *Ibid.*, p. 38.

⁸³ *Ibid.*, p. 54.

"Origin of Species." Both Mill and Comte undoubtedly held to the idea of evolution in individual and racial life. Thus Mill writes of Comte's theory of social development; "From this time any political thinker who fancies himself able to dispense with a connected view of the great facts of history, as a chain of causes and effects, must be regarded as below the level of his age; . . ."⁸⁴ But that the theory of evolution from simpler to more complex forms of structure and of adaptation should throw fresh light upon the length and breadth of nature and of man's life in relation thereto never dawned upon the minds of these positivists. Therefore, great as were their services to human thought in the first half of the century, much of their work has been undermined and much has required revision in the light of the new doctrine.

The revolution in human thought, which has been brought about by the work of Charles Darwin has frequently been likened to those vast changes in world-view effected by Copernicus and Newton. As far back as the closing decades of the eighteenth century, the similarity existing among the various so-called "species" had attracted attention no less than the variations from type presented by members of the same species. In his "*Zur Morphologie*," published in 1807, Goethe formulates the law that the more perfect the being the more dissimilar its parts. He adds that "Subordination of parts indicates high grade of organization," thus anticipating Von Baer's law of 1828. It seems reasonably certain that in this work Goethe had some notion of the evolution of species. But to Lamarck belongs the honor of having first clearly conceived the idea of gradual transmutation of species from an original simpler organism. This change Lamarck attempts to explain by the incessant efforts of each organism to meet the demands imposed by the environment. Constant striving means constant use of organs and such use tends to the development of these organs. The advanced views of Lamarck were sharply opposed by his famous countryman, Cuvier, who drew upon a vast array of data to prove the absolute fixity of species. In England Herbert Spencer was groping toward a satisfactory theory of the evolution of organic forms and enunciated an imperfect explanation⁸⁵ before Darwin's publication of the

⁸⁴ Auguste Comte, and *Positivism*, p. 86.

⁸⁵ Cf. his *Psychology*, first ed.

"Origin of Species." Thus European thought had been gradually made ready for the establishment of that revolutionizing theory which was to bring about a reshaping of every department of human thought.

As early as 1837 Darwin had clearly conceived his problem and had begun that long series of observations, very soon directed by an illuminating hypothesis, which led twenty-two years later to the publication of his famous work. In the Introduction to the "Origin of Species" he gives due credit to Malthus in his "Essay on Population" for suggesting to him a principle of explanation of the gradual development of the different organic species. In Malthus' theory of the struggle for existence among human beings, due to the high geometrical ratio of their increase, Darwin found a clue to the whole problem of organic evolution. Little by little he became convinced that the origin of species may be ascribed to the unceasing struggle for existence in the midst of environing conditions by no means wholly favorable to the organism. This desperate struggle "flows from the high rate at which all organic beings tend to increase." More individuals are produced than can possibly survive. If vast numbers of this progeny were not destroyed, the earth would soon be covered by the offspring of a single pair. In looking at nature it should never be forgotten that every creature is striving to increase in numbers, that each lives by struggle, and that heavy destruction falls on young or old at recurrent intervals. Checks to the increase of any species are found everywhere in the amount of food, conditions of soil and climate, and in the existence of numerous enemies. Owing to the perpetual struggle for life, variations from the type, "if they be in any degree profitable to the individuals of a species in their infinitely complex relations to other organic beings and to their physical conditions of life, will tend to the preservation of such individuals, and will usually be inherited by the offspring."⁸⁶ Thus the favored progeny will have a better chance of survival. Such preservation of favorable individual variations and the destruction of those which prove injurious Darwin calls "Natural Selection, or the Survival of the Fittest."⁸⁷ In this selection of individuals for sur-

⁸⁶ *Origin of Species* (London, 1902), p. 76.

⁸⁷ *Ibid*, p. 98.

vival, Nature cares nothing for appearances save as they can be useful. While man "selects only for his own good," Nature looks only to the good of the being which she tends. Working with extreme slowness, natural selection has at last produced all the myriad species and variations upon the earth. As new forms are produced and gain in strength and numbers, they must inevitably cause the gradual extinction of many old forms whose places they take at Nature's table. It should not be supposed that progress is the key-note of evolution. Not only have useless or harmful variations brought about the prompt extinction of vast numbers of organic forms, but many organisms, having attained a fair degree of adaptation to surrounding conditions, have shown no tendency to greater complexity of structure and function during countless periods of time. Moreover in those instances where, for any reason, the environing conditions have been simplified, natural selection not infrequently brings about a reversion to more rudimentary forms of life. Thus Darwin plainly denies that there is a *necessary* tendency in nature to produce beings increasingly complex in organization and correspondingly varied in function.

The significance of Darwin's thought in bringing about the reconstruction of the entire world-view of the nineteenth century can hardly be estimated. To one man belongs the proud prerogative of shaping the trend of scientific, social, philosophical and ethical systems for generations yet to come. For he has broadened the whole concept of nature and has impressed upon the minds of men the idea of the intimate connection between those silent, insignificant forces, working uninterruptedly in the womb of nature, and the races of mankind in their present form. Once more, as in the days of Copernicus and Galileo, man is removed from his lofty seat in the universe and peremptorily bidden to find a lowlier place. The sphere of natural law is extended in unbroken continuity from the crudest forms of organic life to the intricate thought processes of the human organism. Thus a bright light is shed not only upon the physical life of the world but upon those mental functions which had previously been considered in isolation. In consequence it became increasingly clear that psychology, which treats of the phenomena of mental life, can no longer dispense with the aid of those biological sciences which describe the origin, function and historic develop-

ment of human life. In the broad understanding of Darwin there was room for no belief that man is ennobled by being exalted above the control of natural laws. To the Hegelian school, with its partial idea of evolution as emanation rather than development,⁸⁸ he opposes the naturalistic view of man as a brute animal developing into a spiritual being.

But the fructifying influence of Darwin's view upon social and ethical thought-systems was no less vital than its effect upon psychology. The opponents of his theory had hastened to point out that the bitter struggle for existence among organisms seemed completely in contradiction to theories of sympathy, coöperation and benevolence upon which social and ethical life was grounded. But Darwin had long before considered these objections and met them candidly. He reminded his readers that natural selection in social animals "will adapt the structure of each individual for the benefit of the whole community, if the community profits by the selected change."⁸⁹ Among animals to whom it is clearly advantageous to live in association, those individuals will most readily escape injury or death who have the social instinct most highly developed. Groups of animals in which sympathy and consciousness of mutual dependence prevail over brute egoism will have positive advantages in the struggle for existence. Furthermore natural selection favors that love of parents for their offspring which is the chief factor in the preservation of the human race. Thus all social and moral feelings have their natural history. *Pari passu* with the growth of sympathy, sociability and a spirit of coöperation goes the development of the powers of memory and reflection. This development renders it possible for the individual and the group to recall and estimate past actions in the light of the social good. When speech has developed it becomes a powerful instrument for the dissemination and enforcement of public opinion.

The problem of the relation between the material and the spiritual Darwin consistently and perhaps wisely ignored. That somehow the mental life of man is closely interwoven with the functions of his bodily organs admitted of no denial. Therefore Darwin urged the investigation of man's psychical activity in its

⁸⁸ Cf. Ritchie, Darwin and Hegel, p. 5.

⁸⁹ Op. cit., p. 106.

various stages of development and in connection with the theory of natural selection of the fittest to live. To Darwin the origin of both physical and conscious life appeared as an insoluble mystery. Furthermore his researches into the secret places of organic nature had caused the problem of suffering and evil to be thrust home to his mind and heart with painful intensity. Therefore he could not adopt the easy solution of the orthodox believers of his day which declared that a beneficent Providence had directly created a few elemental forms and had then set the whole machinery of evolution in motion. The reality of the pain and injury, the brutality and bitterness which are the direct outgrowth of natural selection forced him slowly and steadily toward a vigorous scepticism regarding the existence of a Providential Being. Thus, while Asa Gray in America was waging a doughty warfare against the critics of Darwin, in an effort to prove his views not inconsistent with an orthodox theology,⁴⁰ Darwin himself had reached a position of agnosticism.⁴¹ Naturalism had won the day.

The vital significance of Herbert Spencer with reference to the historical development of naturalism lies in his colossal attempt to organize many of the important branches of humanistic knowledge and investigation around the central concept of evolution. In the spirit of the positivist he approaches organic nature and seizing hold of its underlying principle he applies it with brilliant if not complete success to the interpretation of human life in its psychological, social and ethical phases. That Spencer's interest in this vast undertaking was humanistic and practical as well as scientific and speculative can hardly be doubted. He very properly belongs among those intellectual noblemen of whom he writes in the "Principles of Ethics,"⁴² whose highest ambition it is "to have a share—even though an utterly unappreciable an unknown share—in the 'making of Man' the further evolution of Humanity."

Spencer's philosophy he has himself christened as a "Transfigured Realism."⁴³ In his view some objective existence, manifested under some conditions, is "a final necessity of thought."

⁴⁰ Cf. Gray's *Darwiniana*, Essays II, VII, XIII.

⁴¹ Cf. *Life and Letters*, Vol. II, p. 247.

⁴² Vol. II, p. 433.

⁴³ Cf. *Principles of Psychology*, Vol. II, p. 494 ff.

But this does not imply that either the existence or the conditions are more to us "than the unknown correlatives of our feelings and the relations among our feelings." Such a realism neither affirms that any mode of objective existence is in reality what it seems nor that the connections among its modes are what they objectively appear. Behind all manifestations, both inner and outer, is a Power whose nature is unknowable. Yet "its universal presence is the absolute fact without which there can be no relative facts."⁴⁴ Very gradually man comes to learn that, hidden behind all the changing forms of material and psychical life, "the one thing permanent is the Unknowable Reality"⁴⁵ Neither religion nor science has been successful in its attempts to express by concepts the essential nature of the world. The concepts of time, space, force and motion are clear and applicable within the domain of experience. But when they are employed to describe the nature of the Absolute they lead to contradictions and endless difficulties. Ultimately both science and religion will agree that the innermost essence of existence is incomprehensible, although much may be learned of the manner in which this essence is revealed in nature and in man. At the outset, then, Spencer asserts a dualism between experience and reality as fundamental as that which characterizes the Kantian philosophy.

But, although Spencer expressly denies that we can know the hidden nature of the world, yet he employs the concept "force" as the ultimate symbol of both material and psychical existence. In nature the elements of matter and motion are merely forms of the manifestation of force.⁴⁶ By no means can the phenomena of the material world be regarded as spiritual in their inmost nature. Spencer is positive upon this point; for he feels convinced that man can explain the spiritual elements he recognizes in himself only by the help of ideas and relations abstracted from nature. By using symbols borrowed from the external world alone can we form any clear notion of the nature of consciousness.⁴⁷ Thus Spencer reverses the method of the German Romantics who assert the necessity of deriving all

⁴⁴ *Op. cit.*, p. 503.

⁴⁵ *Ibid.*

⁴⁶ *Principles of Psychology* (Third ed.), §63.

⁴⁷ *Ibid.*

concepts explanatory of nature from the conscious states of man. From his fundamental principle Spencer deduces the important corollary that the distinction between psychical and material phenomena cannot be transcended. Both, he maintains, are mutually irreducible manifestations of an ultimate, unknowable Force, and are therefore subject alike to the laws governing all natural phenomena. Between the phenomena of these two modes of energy is an interconnection due to their common determination by the law of evolution.

Thus Spencer's view of material nature is that of a vast unfolding force, revealed under the forms of matter and motion. All phenomena, as manifestations of this primeval energy, are subject to the universal law of evolution which in general means transition from homogeneity to heterogeneity. Evolution has three distinguishing marks. The first is integration or the combination of elements. Such an integration, in the vast cosmic process, is responsible for the origin and development of the solar system. Likewise all organic growth proceeds in part by this method, But only in the most rudimentary forms of life is evolution merely integration. Within the protoplasmic mass, segregation of elements and differentiation of organs are the marks of continued development. Thus a comparison of earlier and later forms shows plainly enough a transition from almost complete homogeneity to great complexity of organic structure. Finally, in order to distinguish dissolution from evolution, both of which are characterized by increasing heterogeneity, it should be added that in evolution there is an advance from confusion to order, from undeterminate to determinate arrangement. Hence development, unlike decay, is a transition from relative chaos to a unified whole. When both integration and differentiation have reached their culmination there must result a state of equilibrium which cannot long be maintained against the ceaseless operation of external influences.⁴⁸ In the progress of time dissolution must inevitably set in, and then there results a new chaos to be followed in its turn by a fresh movement of evolution. Thus nature reveals a rhythmical process of alternate growth and decay.⁴⁹ Which tendency is

⁴⁸ *Principles of Biology*, II, §§315, 316.

⁴⁹ *First Principles*, §§96, 133.

the stronger Spencer makes no attempt to determine. As forces working themselves out in a phenomenal world, no absolute significance can be attached to them, nor can limits be assigned to their operation.

During the countless ages of the evolutionary process, the world has passed from chaos to organization, first on the plane of the inorganic and later on the plane of organic life. Increasing complexity of structure and differentiation of function accompany adaptation to a wider and more varied environment.⁵⁰ The stimuli to which the organism may react become so numerous that a central nervous organization for the registration and association of experiences becomes necessary. In the higher organisms, through the operation of natural selection, this nervous mechanism has attained a high degree of sensitiveness and complexity and is accompanied by the varied phenomena of conscious life. This new mode of the mysterious world-force reveals the same traits as living energy everywhere in nature. Starting from reflex action, mental life passes through the stages of instinct, memory and association up to rational intelligence in the human organism. These grades are marked by an increased richness and diversity of consciousness corresponding to the variety of relations between the living being and the environment. In man consciousness attains its highest complexity and fullness.⁵¹ Yet the psychical energy which renders possible for him not only a more complete adjustment to environing conditions but a more satisfactory adaptation of these conditions to his own needs he shares in some degree with all forms of animal life.

As an evolutionist Spencer was firmly convinced that individual consciousness cannot be adequately explained by the life experience of the individual. Unlike Helvetius, Comte and Mill, he had little faith that ideal characters can be produced by means of a rationally planned education and a favorable social order. In the mental sphere as in the physical, development proceeds very gradually from stage to stage, and the mental products of one stage are incorporated with those of the next succeeding. In all the activities of consciousness hereditary tendencies play an important part. Their influence may be traced in the develop-

⁵⁰ *Prin. of Biol.*, II, §371.

⁵¹ *Ibid.*, §374.

ment of instincts and feelings and in the association of ideas. The empiricist is in error when he fails to see that the original nature of every individual determines the way in which he receives and organizes the matter of experience. Also the criterion of the truth of any proposition, i.e. the consciousness that its opposite would be a contradiction, is an "*a priori* element" not to be deduced from experience. But in making this concession Spencer is by no means yielding the field to the rationalists. Those modes of feeling and knowledge, inborn in the individual, are the results of long periods of racial experience, of a struggle for survival, which has profoundly modified the nervous structure of the offspring. Gradually these racial tendencies develop in the course of personal experience and must be reckoned with in all schemes for individual or social reform.

But the environment of man is social and ethical as well as material; hence adaptation to external nature is but one phase of that complete adjustment which is the condition of the welfare and happiness of the individual. Because of his sincere social interest, Spencer is concerned to show that the original mental equipment of man is not unfavorable to the development of the highest social and ethical virtues. In the closing chapters of his "*Principles of Psychology*" he describes in detail the development of gregarious instincts leading in time to the feeling of pleasure in mere social contact. In the same way he shows how the social instinct, combined with the influence of sexual and parental relations, has directly cultivated social sympathy.⁵² This latter feeling is enormously furthered by every increment of intelligence which increases the power of discrimination and combination and enhances the vividness and variety of representation. In the course of social evolution, egoistic feelings may become altruistic through the influence of sympathy. Thus Spencer does not sharply differentiate these two classes of feelings, but asserts that altruistic emotions "*are all sympathetic excitements of egoistic feelings;*"⁵³ The egoistic factor of altruism finds satisfaction in a social environment which puts no restraint upon the activities. The factor of sympathy, which renders the former feeling altruistic, ever tends, as it de-

⁵² Op. cit., pp. 575-577.

⁵³ Ibid, p. 612.

velops, "to excite a vivid fellow-feeling with this love of unrestrained activity in others;"⁵⁴ In consequence social progress tends toward a state wherein every citizen "will be sympathetically anxious for each other citizen's due sphere of action as for his own; and will defend it against invasion while he refrains from invading it himself."⁵⁵ Such facts as these, declares Spencer, stamp as erroneous the notion that the evolution of mind by the inherited and cumulative effects of racial experiences cannot result in moral sentiments and correlative moral principles which are universal and enduring. Man's whole social history proves the contrary.

It is clear that Spencer draws nourishment for a healthy though modified optimism from Nature herself. He recognizes no deep-rooted antagonism between natural processes and the social progress of man. Furthermore he denies that all advancement depends on natural selection, and therefore he combats the widely discussed theory of Weissman that acquired characters cannot influence the cells of the germ-plasm. Such a view, he feels, has a profound bearing upon social and ethical questions. For if the natures of any large social group are modified by transmission of the effects produced by the institutions and ideals of the social environment, then these agencies can render the evolution of humanity more rapid than natural selection alone.⁵⁶ In the essay entitled "Weissmanism Once More," Spencer urges that, "since all the higher sciences are dependent on the science of life and must have their conclusions vitiated if a fundamental datum given to them by the teachers of this science is erroneous, it behooves these teachers not to let an erroneous datum pass current; they are called on to settle this vexed question one way or another."⁵⁷ His own position he states in "Factors of Organic Evolution" as unreservedly in favor of the theory that "the inheritance of functionally produced modifications takes place universally."⁵⁸

⁵⁴ Op. cit., p. 618.

⁵⁵ Ibid.

⁵⁶ Cf. Preface to *Factors of Organic Evolution*, in *Essays Scientific Speculative and Political*, I, p. 464.

⁵⁷ *Contemporary Review*, Vol. LXVI, p. 608.

⁵⁸ *Essays*, p. 423. See also *Principles of Biology*, II, §314.

The optimism of Spencer regarding the harmony that may exist between Nature and her more vigorous offspring is tempered by recognition of the pain and loss involved in the whole process of evolution. After childhood is left behind and the youth enters upon adult life, no mistaken sympathy should be allowed to interfere with the education gained through struggle with the actual conditions of life. Such an interaction is essential to the vigorous development of both the individual and the race. Here Spencer conceives of Nature as a stern but ultimately beneficent task-mistress of humanity, eliminating the weaklings, but developing intellectual and moral power in the survivors.

Like the development of the individual, social evolution proceeds through natural causes. In his "Principles of Sociology" and likewise in his little essay on "The Social Organism," Spencer draws a detailed analogy between the development of society and the individual organism. Both, in the course of evolution, are characterized by increase in mass and complexity, together with greater mutual dependence.⁵⁹ True to his belief in the educative influence of free interaction with environing conditions, Spencer insists that the State should exercise no more control over its members than is necessary to the preservation of its integrity. Paternalism in government inevitably hinders and complicates development, in societies as in individuals. In social life the reward of every citizen should be proportioned to his worth, his prosperity should be adjusted to his efficiency.⁶⁰ And this can only be brought about if the struggle for survival be no more hampered by social guardianship than is essential to security and order.

The ethical views of Spencer, like his social philosophy, are grounded in biology and psychology. Fundamental in moral development are the principles of sympathy and benevolence; yet these are the products of the struggle and pain of unnumbered primitive generations. In the earlier stages of life, the brute struggle for existence nourishes egoism. But the altruistic impulses, springing from sympathy, slowly develop in strength. Appearing first under the form of care for the helpless, these feel-

⁵⁹ Cf. *Essay on Social Organism*, op. cit., p. 306; also *Principles of Sociology*, §448.

⁶⁰ *Prin. of Soc.*, §322.

ings are gradually extended to include the family, the community, the tribe. In a brief article on "Evolutionary Ethics"⁶¹ Spencer criticises Huxley for opposing the ethical process to that of evolution. Rather is it true, he maintains, that from the dawn of life altruism has been as essential to survival and development as egoism.⁶² The natural laws governing all life force us to conclude "that unceasing social discipline will so mould human nature, that eventually sympathetic social pleasures will be spontaneously pursued to the fullest extent advantageous to all."⁶³ In the fulness of time beneficence will be added to justice, and man will not only avoid inflicting injuries upon others, but will exert "spontaneous efforts to further the welfare of others." Then only will the limit of evolution be reached. And this type of moral nature Spencer confidently asserts to be "one which adaptation to the social state produces."⁶⁴ What is now the character of a rare individual, here and there, may become increasingly general. For that happiness in sacrifice, so far as it does not hinder the development of others, which is now possible only to the best human nature, lies within the ultimate reach of all. Then will ensue that highest type of personal and social life in which there is full and free surrender to activities satisfying and ennobling in themselves, not as means to ulterior ends. To the development of this type of humanity, all moral aspiration and endeavor are tending. No ethical principles can be absolute until this goal is reached; for the realization of absolute ethics is dependent upon a perfect society, composed of perfect human beings. At lower stages of the process of moral evolution, only an approximation to absolute right and goodness are humanly possible. "Hence," concludes Spencer, "it is manifest that we must consider the ideal man as existing in the ideal social state. On the evolutionary hypothesis, the two presuppose one another; and only when they coexist, can there exist that ideal conduct which Absolute Ethics has to formulate, and which Relative Ethics has to take as the standard by which to estimate divergencies from right, or degrees of wrong."⁶⁵

⁶¹ Cf. *Various Fragments* (ed. 1898), p. 121.

⁶² Cf. *Principles of Ethics*, §§75, 76.

⁶³ *Ibid.*, §95.

⁶⁴ *Ibid.*, §54.

⁶⁵ *Ibid.*, I, p. 280.

It may, perhaps, impress the student of Spencer as somewhat inconsistent that the leading evolutionist of his age should write thus confidently of a state of social and ethical perfection in which ideal beings are constantly engaged in pursuits inherently noble and directly designed to promote the general welfare. It may well be asked what guarantee nature affords that any such equilibrium between egoism and altruism, inclination and ideal, will ever be attained. If the ultimate term in nature be Force, revealing itself, not in an equilibrium of energies, but in a rhythmic process of change, development, decay, by what right does any individual holding this view speak of a perfect future state of humanity and of an "absolute ethics"? Do not these two conceptions present a fundamental antithesis? To be sure, nature is responsible alike for selfish impulses and for beneficent ones. Moreover she has developed self-consciousness in one phase of her all-embracing life. But does the struggle for existence on the plane of the physical, the social, the ethical, hold out to man any hope that definite limits may be assigned to it? Does it not rather suggest that a state of conflict, produced whenever organized habits are confronted with novel conditions—a state followed by more or less successful accommodations of organism and environment—is of the very nature of life, be it physical, or mental, social or moral?

In view of the fact that Spencer lays down the principle, at the outset of his "Synthetic Philosophy," that Force is the ultimate symbol by which man conceives of a Power in itself unknowable, his naturalism avoids the pitfalls of an avowed materialism. Although unreservedly a naturalist in his general method and point of view, Spencer's deep humanistic interest impels him to dream of an idealized humanity and even to leave the door ajar for the restoration of the old gods to their temple. For, although to Spencer's intelligence, there could be no satisfying worship of a Deity whose attributes were forever shrouded in mystery, yet many another mind might accept his theoretical position while deriving spiritual satisfaction from a continuance of the old religious rites. An unknowable God at least has reality and thus can be pictured by the imagination and adored by the heart of man.

During the closing decades of the nineteenth century the issues of naturalism and humanism were more sharply defined than ever

before and the conflict between these world-views grew proportionally bitter. In Germany a revolt against the extremes of Romanticism was led by Vogt, Moleschott and Büchner. Taking their stand upon the established facts of science, these men preached a doctrine of unadulterated materialism. In their view the law of the conservation of energy is the ultimate principle from which all conceptions of the universe must take their rise. But in the breasts of these extreme materialists there burned a flame of humanistic feeling which led Büchner to protest against the confusion of materialism as a method and world-view with materialism in relation to the guidance of life. While the materialist asserts that the noblest emotions and the loftiest ideals are essentially functions of matter, yet he accords to them their full value in the evolution of a worthier humanity.

In sharp opposition to the *Weltanschauung* of the materialists is that of the modern idealistic school represented by Messrs. Royce and Bradley and by the two Cairds. Humanists to their hearts' core, these contemporary representatives of idealism find it impossible to conceive of an external nature save in relation to a conscious subject. A leading representative of the school writes thus: "The words 'objectivity,' 'object,' carry with them as their inseparable correlatives 'subjectivity,' 'subject,' and to ask us to conceive of an object which is out of relation to a subject, is to ask us to conceive of that which is given only *in* relation as existing *out of* relation—of that which has no meaning save in and for consciousness, as existing outside of consciousness."⁶⁶ Hence the notion of a system of nature as maintaining itself independent of consciousness is a complete illusion, for "thought or intelligence is presupposed in all objective reality." To be sure man does not create the thought which is in nature and humanity; rather does he discover a rationality independent of himself to which his reason readily responds. "The history of science is the history of mind or intelligence finding itself in nature."⁶⁷ Now, since reason is impelled to discover beyond the flux of phenomena an enduring unity, an absolute reality, it cannot seek here any more than in the world of sense an object out of all relation to thought. For "that which is at once the pre-

⁶⁶ John Caird, *An Introduction to the Philosophy of Religion*, p. 21.

⁶⁷ *Op. cit.*, p. 22.

supposition and the final goal of thought is not and cannot be an Absolute which is simply the negation of thought, but rather that which comprehends all finite things and thoughts only because it is itself the Unity of Thought and Being."⁸⁸ It is of the very nature of this Absolute to realize itself, not alone in the external world but in the highest degree in the self-conscious life of humanity. And the awful grandeur surrounding the idea of the Absolute Reality arises from the belief, not that it is forever unknowable, as Spencer would have us think, but that it is for human consciousness the realization of its noblest ideal of spiritual excellence. Thus, once more man places himself at the apex of existence and surveys with a lofty serenity the world of nature which is merely the objective aspect of his own thought-life. Because he is the highest manifestation of the Absolute he can discover in nature that rational plan, "in all thinking things, all objects of all thought," which has been working itself out through the ages to its proximate culmination in himself. All further progress can only consist in the development of his finite intelligence and will into closer likeness to that of the Absolute of which it is a feeble expression.

Truly, the antithesis between these two world-conceptions, thus briefly suggested, seems complete. Both in spirit and in method they are antagonistic. One school reveals that deep-rooted respect for facts capable of objective demonstration which leads it to refuse all credence to the so-called "baseless assumptions" of the idealist. Science has laid bare the mechanism of a world in gradual process of evolution from chaos to relative order and organization. In the course of that development creatures have been produced having the capacity to regulate their adjustments to external conditions by intelligence. In human beings this capacity for intelligent adaptation seems greatest. But nowhere in the unbroken nexus of cause and effect can the scientist discover anything more than *Kraft und Stoff*—matter in process of change by means of its own inherent energy. And this change is by no means always in the direction of higher organization and more complete adaptation. Retrogression and decay are facts of evolution as ultimate as that which we call progress. By what right does man set himself up as lord of the universe? The con-

⁸⁸ Op. cit., p. 23.

scious life of which he is so inordinately proud may be only a by-product or "epiphenomenon" of natural forces—a mere incident in the vast cosmic life. Moreover, although by means of his rational endowment man may adjust himself to a vastly broader environment than the oyster, and may even adapt the conditions of nature to his own use, who shall say that the adjustment in the one case is relatively any more complete or satisfying than in the other. Let man "leap off his own shadow" and view himself as only one of the countless offspring of a nature not only prodigally fruitful but relentlessly destructive.

In the mind of the humanist such a world-view strips man of all dignity, robs his ideal life of all ultimate meaning, and snatches from him those priceless conceptions of God, freedom, and eternal life which are bound up with his deepest emotional experience and with his loftiest aspiration and achievement. To his view there can be no satisfactory compromise between a crass materialism, a complete surrender to brute force, and that explanation of the world which interprets all its manifestations in terms of its final product—self-consciousness. The idealist reveals a profound distrust of natural beginnings which impels him to set up his own mental processes as the touchstone of all reality, the criterion of all meaning. The materialist, on the contrary, rarely gets beyond origins to meaning. Hence he is blind to the fact that his whole mechanical philosophy is a method of control of natural processes in the interest of ideal meanings. Here and there a rather weak-kneed attempt at compromise is found in such post-Kantian scientific thinkers as Mr. Karl Pearson, who maintains that the concepts of science are merely short-hand descriptions (never explanations) of our perceptual experience. Science should therefore content itself with the problem of working out a conceptual shorthand that will accurately describe the facts of experience in any sphere. What lies back of sense impressions is absolutely unknowable; hence the problem of whether or not life is a mechanism cannot be settled on that basis.⁶⁹

But such attempted compromises accomplish little in bridging over the chasm between the world-conceptions of the humanist and the naturalist,—conceptions springing largely from temperamental differences. In his wonted humorous and telling fashion,

⁶⁹ *Grammar of Science*, p. 332.

Professor William James has compared the temperament and attitude of the empiricist and the rationalist in such wise as to bring into clear relief their striking contrasts. The empiricist, as "tough-minded," is characterized by a regard for facts; he is materialistic, irreligious, pluralistic and sceptical. His "tender minded" opponent, on the contrary, is idealistic, optimistic, religious, monistic and dogmatical.⁷⁰ Now Mr. James clearly recognizes that the naturalistic spirit is in the ascendant in this year of our Lord, 1910. But he also takes note of the fact that this spirit, as expressed in crude materialism, is far from spiritually satisfying to the reflective man. If the thoughtful individual turns to the idealist, however, for satisfaction of his inward craving for spiritual values, he pays for his escape from materialism "by losing contact with the concrete parts of life. The more absolutistic philosophers dwell on so high a level of abstraction that they never even try to come down."⁷¹ Now the reflective minds of the present day demand a philosophy of life which combines the devotion to facts characteristic of the naturalist with that reverent faith in ideal values which marks the humanistic creed. Such a philosophy, it seems to the writer, is furnished by that much misunderstood, much berated theory of reality, truth and moral worth which passes by the name of pragmatism. It will be the purpose of the concluding chapter of this study to attempt a reconciliation of the conflicting attitudes of naturalism and humanism by recourse to the pragmatist's explanation of nature and of human life. If this philosophy can satisfy two of the deepest needs of human nature—the need for demonstrable truth and the need for spiritual values—by a consistent theory of the meaning and worth of existence, it thereby approves itself as the soundest philosophy upon which to ground a general theory of education.

But before this final task is attempted, it will be desirable briefly to trace the shaping influence of humanism and naturalism upon educational principles and practice from the Renaissance to the present time.

⁷⁰ *Pragmatism*, (ed. 1908), pp. 10-13.

⁷¹ *Op. cit.*, p. 19.

CHAPTER V

HUMANISM AND NATURALISM IN EDUCATION

In the preceding chapters the word "humanism" has been used in its broadest philosophical sense to signify that world-attitude which tends to interpret the universe in terms borrowed from the consciousness of man, and to identify the goal toward which all things are supposed to move with the spiritual advancement of humanity. Throughout the present discussion, however, the term "humanism" will be employed in its more customary usage to indicate that type of classical education which flourished with small let or hindrance, from the age of the Italian Renaissance until well-nigh the middle of the nineteenth century. Slowly and most reluctantly this conception of education has yielded ground to the militant educational philosophy of naturalism, until in some places to-day it finds itself on the defensive in a struggle to maintain its position in the curriculum. What, then, are the significant facts in the origin and development of humanism, and what influences have been at work to draw the sharp line of demarcation between the sciences and the "humanities" so noticeable at the present time?

After the decay of the civilizations of Greece and Rome, barbarian Europe required an interval of growth covering a thousand years before it had attained the intellectual stature necessary to understand and appreciate the remnants of pagan culture it had carelessly preserved. But when the hour was fully come, when the autonomous city-states of Italy had nourished a vigorous citizen-body, keen and alert in mind and sensitive in aesthetic temperament, then, once more, the treasure-houses of Greek and Latin thought were opened wide to an eager throng. Turning with disgust from the endless disputations of Averroists and Aristotelians, the leading minds of Italy sought refreshment in the recovered literatures of those pagan civilizations which they gratefully recognized as vastly superior to their own. One by

one the great writings of antiquity were recovered from musty corners; the various manuscripts were compared and edited with enthusiastic zeal; and the completed works were once more put within the reach of minds prepared to assimilate their contents and to apply their ideals to the life of the fifteenth century. For it should never be forgotten that, in its inception, the Renaissance was a far broader movement than the mere revival of classic culture. The intellectual, emotional and aesthetic life of the Italian republics had been quickened, the sense of personal power and worth profoundly deepened, by their varied political and economic activities. "More and better life!" was the watchword of the age; and the pagan writings, sounding, as they did, the heights and depths of human nature, and covering the whole wide gamut of human interests, satisfied the deep craving of the age for a richer spiritual experience than was furnished by the outworn culture of the Middle Ages. It was because the Greeks and Romans had trod before them the paths leading to knowledge of man's inmost nature, and had blazed in clear letters the principles of political, social and moral well-being, that the merchant-princes and self-made despots of Italy followed so eagerly in their trail. Moreover, as has frequently been pointed out, the Italian humanists, great and small, felt a deep, instinctive response of their whole nature to the sonorous rhetoric and vigorous, clearly comprehensible thought of the late Republic and the Augustan age. These virile thinkers whose masterly style brought exquisite aesthetic satisfaction to the Renaissance scholars, were their own progenitors,—the noble ancestors of the Italian people, whose highest ambition it should be to restore some semblance of the political and intellectual splendor that once was Rome. The term "*humanitas*," then, did not at first refer primarily to literature but to life. In the words of a famous humanist of the fifteenth century, "Learning and training in Virtue are peculiar to man; therefore our forefathers called them '*Humanitas*,' the pursuits, the activities proper to mankind."¹ But he quickly adds: "And no branch of knowledge embraces so wide a range of subjects as that learning (i.e. classical literature) which I have now attempted to describe."

¹ B. Guarino, *De Ordine Docendi et Studendi*; trans. by Woodward in Vittorino da Feltre, p. 177.

Foremost among the pioneers of humanism is Francesco Petrarcha, the enthusiastic champion of the revival of classic culture, and the resolute foe of ignorance and obscurantism. Endowed with rare personal charm and finding himself in entire sympathy with the broad, deep currents of thought in the Italy of the fourteenth century, Petrarch performed a great work for his own age and for posterity in stimulating the recovery and appreciative study of the most valuable works of Latin literature. That the humanistic movement suffered greatly from the fact that its most influential exponent was ignorant of Greek can hardly be denied. The rich culture of Greece was known to Petrarch only in mediocre translations; hence he was unable to arouse that zeal and enthusiasm for its recovery which he so successfully awakened for the restoration of Roman literature. In deploring this fact a contemporary critic of Petrarch has gone so far as to write: "If Hellenic influences have never played their due part in our education, if the proportion between the Greek and the Roman elements has been unnatural, this is owing mainly to the insufficient opportunities of Petrarch and his earliest disciples." And he further maintains that "if the first Humanist had known and appreciated Homer and Plato and Sophocles, as he did Cicero and Virgil and Seneca and Livy, all our modern culture would be something far finer. We should be simpler and clearer in our conceptions, and better developed aesthetically."² Be this as it may, the Italian people never responded to Greek thought with that whole-souled allegiance so joyfully rendered to the literature of their forefathers. Here and there the study of Greek was carried on with enthusiastic appreciation as in the Platonic Academy at Florence. The great humanists like Filelfo, Ficino and Guarino lectured on both the Greek and Latin masterpieces; but Greek scholarship on the whole was confined to Florence and had already begun to decline by the opening of the sixteenth century. With the death of the last of those Byzantine exiles, driven to seek a home in Italy after the Turkish conquest of Constantinople, the study of Greek literature pined away. Fortunate it was for the rest of Europe that such scholars as Agricola, Reuchlin, Erasmus, Grocyn and Cheke had already carried the rich fruitage of Greek thought to the countries north of the Alps.

² Robinson and Rolfe, Petrarch, p. 237.

The universities of Europe, given over as they were to the apotheosis of Aristotle and Averroës, offered but scant hospitality to the devotees of the new learning. Hence it came about that it was in the papal chancelleries of Nicholas V and Leo X and in the courts of Alfonso of Naples, Frederick of Urbino, the Medici, the Sforza and the Mantuan princes that humanism found a congenial home. Here state correspondence was carried on by the leading humanists of Italy in their capacity as papal or princely Secretaries. Faultless Latin style characterized most of this correspondence, both official and private. Indeed, few letters were written by humanists in those days which were not intended for immediate or ultimate publicity. This intense admiration of Roman oratory, especially that of Cicero, was revealed in the earnest efforts of every humanist to excel in this new field of self-expression. As envoys to foreign governments, as public speakers designated to welcome visiting princes, as newly appointed officials, those versed in Latin eloquence were given ample opportunity to display the breadth and exactness of their classical scholarship and the peculiar felicities of their style. Soon the emphasis upon forcible, varied and graceful expression, according to the accepted canons of Latin style, received marked and increasing emphasis. Indeed, for more than two centuries the humanists took the position that Latin was and must remain the only language worthy to be the instrument of literature. Hence a strong pressure was brought to bear against all misguided poets who attempted to voice their sentiments in the Tuscan tongue.⁸ From the end of the fourteenth century Cicero was universally acknowledged as the model of pure Latin prose. Both letters and orations were patterned more or less slavishly after his style in both vocabulary and phrasing. By the close of the fifteenth century the admiration of Cicero had reached such extremes that every word or phrase which his usage did not sanction was peremptorily rejected. It was such deadening imitation, destructive of all individual thought and expression, which drove Erasmus to write his famous satire on the *Ciceronians*. Thus the original spirit of self-assertive individualism, of development of personal force and talent in the service of art, letters and society, led ultimately, when the whole movement was on the wane, to

⁸ Cf. Burckhardt, *The Renaissance in Italy*, pp. 252 ff.

"artifices of expression, skilful imitation of things worthy as a substitute for becoming worthy, ..."⁴

Such an awakening of intellectual and emotional life, happily combined with the restoration of a great literature, speedily brought about a changed conception of education. In such centers as Florence, Venice, Padua, Ferrara, where humanism flourished, a new educational philosophy was elaborated and new types of schools were founded by the humanists themselves. Prominent among these exponents of a new education were Paulus Vergerius, Guarino da Verona and Vittorino da Feltre. The former, in his influential work entitled "*De Ingeniis Moribus*," went far to shape the educational thought of Italy for more than a century after his death. His essay, with the newly discovered treatise of Quintilian, set the standards of humanistic education followed by all the leading Italian educators. A study of this work will amply repay the historian of education, since it sets forth all the controlling interests and ideals of this age of spiritual renaissance. The treatise is addressed to Ubertinus, the younger son of Francesco Carrara, the lord of Padua. Vergerius congratulates the young patrician upon his desire "to add to the career of arms traditional in (his) family, an equal success in that other great discipline of mind and character, the study of literature."⁵ Both careers appeal to men of noble spirit and both lead to fame and honor in the world. To a ruler the art of oral and written expression "is no slight advantage in negotiation whether in public or private concerns. Especially in administration of the state, when intervals of rest and privacy are accorded to a prince, how must he value those means of occupying them wisely which the knowledge of literature affords to him."⁶ It should be the highest duty of a parent to train his son in sound learning, that he may win distinction for his name and bring honor upon his native city. Such are the aims of humanistic education at its best—to equip young men of birth and breeding for the attainment of social, political and intellectual distinction, in an age brimful of stimulating opportunities, and to enrich the mind with learning

⁴ Woodward, *Education during the Renaissance*, p. 6.

⁵ For translation of Vergerius' treatise see Woodward, *Vittorino da Feltre*, pp. 96-118.

⁶ *Op. cit.*, p. 104.

against the approach of age. For once more Aristotle's ideal of "the noble use of leisure" has seized the minds of men. Thus Vergerius urges the study of humane letters as "a spring of interest for a leisured life. . . ."⁷

Like many another humanistic educator, Vergerius urges that diligent study be made of the temperament and tastes of the youth to be educated. Bent of character may be recognized in early years and should guide the work of the teacher. This prescription was faithfully carried out by Vittorino in his school at Mantua, with the result that few of his students did not receive from him definite and well directed assistance in attaining distinction in their future careers. Such study of temperamental tendencies was felt by most humanists to assist the instructor in the moral education of youth, a branch of training which was never lost sight of by the Renaissance educators.

Vergerius next considers those studies rightly included in a complete education. In this connection he frames that definition of liberal studies which embodies the noblest conceptions of humanism. We call those studies *liberal* which are worthy of the free man; those studies by which we attain and practice virtue and wisdom; that education which calls forth, trains and develops those highest gifts of body and of mind which ennoble men, and which are rightly judged to rank next in dignity to virtue only."⁸ It will be seen that, like the Greeks and Romans, Vergerius restricts a liberal education to the "free man," to the favored child of fortune with wealth and leisure. And this restriction has clung to humanistic education from his day almost to the present time, giving to it that character of class prerogative so marked in the traditions of English education.

In naming those studies which are truly "liberal," Vergerius accords first place to history "on grounds both of its attractiveness and its utility, qualities which appeal equally to the scholar and to the statesman."⁹ Next in importance rank moral philosophy, which is designed "to teach men the secret of true freedom," and eloquence, which enables us so to present the

⁷ Op. cit., p. 104.

⁸ Ibid, p. 102.

⁹ Ibid, p. 106.

truths of history and philosophy as to bring conviction to widely differing minds. Since grammar and the rules of composition furnish the foundation upon which the whole study of literature must rest, their importance should be recognized at the outset. Closely associated with these rudiments is logic, "the guide to the acquisition of knowledge in whatever subject." Next comes rhetoric, which Vergerius deplores as "well-nigh a lost art." Yet he insists that oratory, so despised in his day, must be revived if Italian youth "would earn the repute of true education" and would emulate the accomplishments of their ancestors.¹⁰ After eloquence are placed music, arithmetic, geometry, and astronomy, the last of which "lifts us into the clear calm of the upper air." At this point Vergerius pays a remarkable tribute to naturalistic studies, too frequently slighted if not ignored by narrower humanists. "The knowledge of nature—animate and inanimate—" he writes, "the laws and properties of things in heaven and earth, their causes, mutations and effects, especially the explanation of their wonders by the unravelling of their causes—this is a most delightful, and at the same time most profitable, study for youth."¹¹ Had humanism accepted this wise judgment of one of its most liberal exponents, the sciences would never have been forced into a bitter struggle for recognition; and the sharp antagonism between the humanistic and the scientific studies might never have developed. But the attitude of the humanists of later generations toward the naturalistic studies was far less liberal than that of Vergerius. Writing in 1450 to Ladislas, the young king of Bohemia, Aeneas Sylvius yields a rather grudging recognition to geometry and astronomy on the ground of their utility. But he urges his young protégé not to permit these studies to become too absorbing. "There is a danger," he cautions, "lest in our interest in natural, or external, objects we find but a lower place for those weightier things which concern character and action."¹² This represents the position of the typical humanist. Battista Guarino, writing in 1459, accords no place to the study of the sciences,¹³

¹⁰ Vergerius' Treatise was written about 1392, before the enthusiasm for oratory had developed.

¹¹ Ibid, p. 108.

¹² Op. cit., p. 156.

¹³ See his *De Ordine Docendi* in Woodward's *Vittorino*, pp. 161-178.

although his renowned father was the first modern to grapple with the problem of ancient geography. At the advanced age of seventy-nine, Guarino of Verona corrected and translated the text of Strabo, completing the great work in three years.¹⁴ Half a century later, Erasmus, dreaming his favorite dream of a "republic of enlightenment," which should include all the nations of Europe, made one by the possession of a common classical and Christian culture, showed scant sympathy toward the investigation of nature. So marked was the indifference of this master-humanist of the North, that Luther was moved to fling a bitter jibe at his opponent: "Erasmus is indifferent and does not care to know how fruit is developed from the germ. But by the grace of God we already recognize in the most delicate flower the wonders of divine goodness and omnipotence. . . . Erasmus passes by all that, takes no account of it, and looks upon external objects as cows look upon a new gate."¹⁵

But to return to Vergerius. Like most of the earlier Italian humanists, our author accords a high place in the education of a prince to the arts of war. From "his earliest years a boy must be gradually inured to privations and grave exertion, to enable him to bear strain and hardship when he reaches manhood."¹⁶ Luxury only enervates mind and body alike, while exertion fortifies both and develops courage and endurance. Therefore as soon as a boy is able to use his limbs let him be trained to arms. Let him "learn the art of the sword, the cut, the thrust and the parry; the use of the shield; of the spear; of the club; training either hand to use the weapon."¹⁷ Furthermore let him be exercised in running, jumping, wrestling, boxing, archery and horsemanship, for by variety of exercise the youth may be made ready "for combat hand to hand or in troop." With this bodily training should go instruction in the principles of generalship, strategy and tactics, that the future leader may have that calmness and confidence which belong only to him who has thoroughly learned his art. The emphasis upon bodily exercise, not only for its future utility but for its physical and moral value,

¹⁴ Woodward, *Education during the Renaissance*, p. 33.

¹⁵ Painter, *Luther on Education*, p. 163.

¹⁶ *Op. cit.*, p. 113.

¹⁷ *Op. cit.*, p. 115.

is found in the educational treatises of all the fifteenth century Italian writers. Aeneas Sylvius devotes the first part of his work "*De Liberiorum Educatione*" to a discussion of the proper care and development of the body, even going into details respecting food, drink and clothing. These things, however, "are worthy of regard only so far as they are indispensable to the vigorous activity of body and spirit: all beyond that is triviality or effeminacy."¹⁸ The early and more vigorous humanism, then, departed entirely from the Middle Age view of the essential evil of the body, necessitating its rigid suppression and neglect. Something of the Greek ideal of the harmonious development of a beautiful body as the home of a gracious and well-developed soul animated the minds of the humanists of the Quattrocento.

One further aspect of the humanism of the Italian Renaissance may claim our attention for a moment. In sympathy with the eager desire for self-expression and personal distinction so characteristic of the period, marked attention is given by many writers to habits of dress and manner and to details of courtly behavior. Both Vergerius and Aeneas Sylvius pay slight tributes to this aspect of humanistic education, but its most appreciative exposition may be found in the "*Il Cortegiano*" or the "*Doctrine of Courtesy*,"¹⁹ written by Baldassarre Castiglione in 1528. This influential work was animated throughout by the Renaissance idea that personality "is one complex of morals, intelligence, emotions and activity." Every movement or every attitude of the body, every gesture, every detail of graceful and becoming dress reveal the inner man. Castiglione's Courtier was the ideal personality as conceived by humanism. In an age when the Court throughout Europe was the dominating force in social life, upholding the highest standards of intellectual and political achievement, the Courtier had an important rôle to play as director and adviser of his Prince, serving him "in all ways which may redound to his honor and interest. . . ." Therefore he must be skilled in Arms and Letters,²⁰ and must be master of the arts of pleasing address. For in a true Courtier there should be no discord between character, intelligence and action.

¹⁸ Woodward, *op. cit.*, p. 140.

¹⁹ *The Book of the Courtier*, trans. by Opdyke, 1901.

²⁰ *Op. cit.*, p. 59.

The preceding discussion, incomplete and fragmentary though it be, may perhaps bring into clearer relief the intellectual breadth and the moral and social trend of humanism in its vigorous prime. The princely school of Vittorino da Feltre at Mantua affords convincing evidence of the splendid results that can be accomplished under the stimulus of the highest humanistic ideals, and in a society where the orator has an important rôle to play. Here were gathered not only the sons of Italian rulers but promising children of the middle class, designed for professional life. Here first in modern times was worked out the Greek ideal of a harmonious and complete education of body, mind and spirit. The rare and lovable personality of Vittorino himself, combined with his single-eyed devotion to intellectual and moral excellence as expressed in the service of the state, animated the entire work of the school.

But these worthier ideals and practices of humanism were on the wane in Italy by the opening of the sixteenth century. The enthusiasm for the enrichment of human life and for a truer understanding of human nature, which had made the literatures of Greece and Rome but a means to the attainment of a noble purpose, was ebbing away. The tendency to make the mere mastery of the ancient tongues the test of the educated man, and to put showy rhetorical accomplishment before effective social and intellectual achievement grew apace. In the closing years of the fifteenth century the Renaissance movement, shorn of its first strength, swept north of the Alps. Carried into France by the victorious armies of Charles VIII and Louis XII, it encountered the bitter opposition of the University of Paris, where theology had sat enthroned since the days of Albertus Magnus and St. Thomas Aquinas. But, under the patronage of the young King Francis I, humanism slowly made its way into general favor. The Collège de France began its career in 1530 with the establishment, by its royal founder, of chairs in Greek and Hebrew, and later in mathematics and Latin. Guillaume Budé, made Royal Librarian by Francis in 1522, was unwearied in his efforts to spread throughout the length and breadth of France the civilizing and ennobling influences of humanistic learning. At his death in 1540 humanism had won the day against the scholastics and obscurantists of the universities and was transforming the intellectual life of the French people. As in Italy, the movement

at its height was sound and virile. Although well-nigh the whole of liberal learning was conceived to be comprehended in the ancient writings, yet these were regarded as but the means for setting free the powers of the individual for service in church, state or the world of letters. Budé rails at the theologians of the University of Paris because they "will not understand that the function of eloquence is to serve as the instrument of knowledge in its relation to life, without which truth cannot be translated into action; just as a mechanic engine which no one knows how to work is no engine at all but a mere mass of metal."

Toward the middle of the fifteenth century, Aeneas Sylvius, former secretary at the court of the Emperor Frederick III, declared that the German nobles "prefer horses and dogs to poets, and like horses and dogs they shall go down fameless unto death."²¹ Yet before the century had ended Agricola and Reuchlin had returned from Italy bearing the fruits of the ancient learning to their native land. Here, as elsewhere, the new leaven wrought a marvellous change in the thought-life of the German nobles and burghers. Aided by the printing press, which gave an impetus to the diffusion of culture, Germany passed far more rapidly than had Italy through various stages of humanistic development. Her earlier humanists gave only a partial allegiance to pagan literature, showing a disposition to eliminate all works which were antagonistic to the spirit of Christianity and to adapt the others to the purposes of Christian teaching. A broader and more enthusiastic humanism prevailed before the close of a generation. Under the potent leadership of Erasmus, that prince of humanists, the countries of the North began the great work of reorganizing schools and universities in the spirit of humanistic culture. Erasmus himself, keeping steadily before his eyes the ideal of a united Europe, held together by the bonds of a common language and culture, travelled and wrote and taught in the furtherance of this inspiring end. His was no grudging acceptance of classic learning, even while he felt that pagan thought should be supplemented by an enlightened Christian teaching. Turning with disgust from the ignorance, grossness and vice of his age, he breathed with delight the atmosphere of the ancient world where government and order were secured

²¹Whitcomb, *Source of the German Renaissance*, p. 1.

to all and learning was coextensive with civilization. Yet Erasmus was far too wise to dream that the political system and the culture of the Roman Empire could be reproduced in the Europe of the sixteenth century. Rather did he long to combine a comprehensive and thorough knowledge of ancient literature with sound Christian learning, which last he felt could be rightly understood only in connection with the thought-life of the pagan world in which it had developed. From the study of classical literature Erasmus looked for a broadening of men's interests, a stimulation of their rational power, a wider dissemination of sound learning. Yoked with a purified Christian doctrine, pagan thought was to reform flagrant social evils and lift the life of humanity to a worthier plane than it had ever been able to reach since the decay of imperial Rome.

Thus ignoring mathematics and the newly developing sciences of cosmography and astronomy as lacking in human interest, Erasmus regards pagan and Christian literature as the only suitable material for education. "Language . . . claims first place in the order of studies and from the outset should include both Greek and Latin." For "within these two literatures are contained all the knowledge which we recognize as of vital importance to mankind."²² Here is the fine essence of humanism. Yet, broad as are the educational views of Erasmus, they lack something of the comprehensive and gracious spirit of early Italian humanism. To be sure he urges that learning is but a means to efficient living, that "no man is born to himself," but to his country and his God;²³ moreover he maps out a wide field of classic literature to be read with intelligence and appreciation that it may furnish the material for graceful and eloquent expression. But Erasmus's scheme of education omits elements that were fundamental in the work of Vittorino. Bodily grace and vigor as in itself a worthy thing, makes no appeal to him. Only as intimately related to the health of the mind and soul can the body claim any care and attention. Furthermore Erasmus has little appreciation for the charm and wonder of nature in her "visible forms." In the "*De Ratione Studii*" he classes natural science, mathematics, geography and astrology all under the com-

²² *De Ratione Studii*, trans. in Woodward's Erasmus, p. 163.

²³ *De Pueris Instituendis*, op. cit., p. 187.

non term *res* and feels that their understanding depends wholly upon a grasp of the ancient languages. For, like most of the humanists of his day, he recognizes no sound and organized knowledge concerning natural phenomena other than that to be culled from Greek literature. And when one considers that naturalism was in its earliest infancy, even if it could be said to exist at all in Erasmus's day, his position is not difficult either to understand or to justify. Yet it remains true that Vittorino found room in his curriculum for special treatment of the quadrivial studies; whereas Erasmus regarded them as forms of "eruditio" or information necessary to be imparted to the student in order that the ancient writings should be better comprehended. Nowhere is it suggested that observation of natural events might furnish a new and valuable source of knowledge in addition to classical learning. And Erasmus's attitude expresses the tendency of the age. Finally, a whole-hearted appreciation of the sheer beauty of classic thought and style never inspired Erasmus to the degree that it animated the Italian humanists. The sober, ethical and religious character of the German Renaissance was brightened by little genuine aesthetic enthusiasm. But this limitation was also a safeguard, since the Germans did not fall so completely as did their Italian contemporaries into the absurdities of Ciceronianism.

The Renaissance movement first stirred English thought in the closing years of the fifteenth century, when Grocyn and Linacre returned from a sojourn in Italy full of zeal for the dissemination of the new learning. Both had drunk at the fountain-head of humanism in an age when Lorenzo de Medici was the generous patron of scholarship and when the Platonic Academy was exercising a potent influence in the spread of Greek culture. Linacre had even enjoyed the rare good fortune of sharing with the sons of Lorenzo the instruction of the renowned humanist Politian. Returning to Oxford about 1493, these English pioneers began the great work of introducing an enlightened humanism into the universities of England. Some years later John Colet caught fire from the enthusiasm of his Oxford teachers, and spent some years in France and Italy in study of the great writings of antiquity, especially the works of the early Christian Fathers. In 1512, Colet, then Dean of St. Paul's, founded that famous school which was destined from its beginning to be a centre of

humanistic education and to furnish an example to the other "great Public Schools" of England—those already established and those soon to be founded—with respect to the proper subject matter of a "liberal education." For Dean Colet resolutely rejected all "barbary, all corrupcion, all laten adulterate, which ignorant blynde folis brought into this world, ..." and proclaimed his desire that his boys be taught "good litterature, both laten and greke," and especially those authors as had the "veray Romayne eliquence joynyd with wisdome, specially Cris-tyn anctours that wrote theyre wisdome with clene und chast laten other (either) in verse or prose. . . ." ²⁴

Early humanism in England, as reflected in the writings of Sir Thomas Elyot and to a less degree of Roger Ascham, kept in sympathetic touch with the social and political needs of a country in process of development into a vigorous world power. In Elyot's quaint work "*The Boke named the Governour*," published in 1531, are sounded the same notes which are struck over and over again by Italian humanists. Here is no mistaken tribute rendered to classical learning for its own sake. At the outset Elyot urges parents of means to educate their sons for "the administration of a publike weale."²⁵ No one appreciated better than himself the great opportunities open to youths of ability and learning in the age of Henry VIII, and England's sore need of such men. And if "learning" chiefly meant to Elyot the acquisition of ancient languages and literatures, he was but subscribing to the most enlightened opinion of his age. It should be remembered to his credit that he regarded grammar as "but an introduction to the understanding of autors" whose writings have sounded the heights and depths of human capacity and achievement. Elyot lays out a broad course of reading and study in the Latin and Greek poets, historians and orators. In oratory the youth should form his style upon the great models of Isocrates, Demosthenes and Tully. The "utilitie" of such study lies in this, "that, when he shall happe to reason in counsaile, or shall speke in a great audience, or to strange ambassadors of great princes, he shall not be constrayned to speake wordes sodayne and desordred but shal bestowe them aptly and in their places."²⁶

²⁴ Statutes of St. Paul's School, in Lupton's *Life of John Colet*, p. 279.

²⁵ *The Boke named the Governour*, Croft ed., 1883, Vol. I, p. 27.

²⁶ *Op. cit.*, p. 76.

The subordination of knowledge to the purposes of life is here suggested. Moreover it is pleasant to record that the study of "cosmographie" finds in Elyot a cordial adherent. To be sure this subject receives recognition chiefly because it prepares the child for a better understanding of history. Yet also it shall be "for refreshing the witte a convenient lesson to beholde the olde tables of Ptolomee, where in all the worlde is paynted"²⁷ As a true humanist of the broader school Elyot does not neglect the consideration of questions of moral and physical well-being. But his treatment of the latter is far from revealing the breadth and insight of the Italian educators. With sturdy English prejudice he maintains that of all forms of moderate exercise for securing to the youth "good astate in his body" none in his opinion "may be compared with shootinge in the longe bowe, and that for sondry utilities that come thereof, wherein it incomparably excelleth all other exercise."²⁸ "Tenise" likewise is "good exercise for yonge men"; but "foote balle, wherein is nothinge but beastly furie and exstreme violence" should be "put in perpetuall silence."²⁹ So history repeats itself, and the game condemned of the wise in the sixteenth century again falls under the ban in the twentieth—and for the same reasons.

In the foregoing pages the attempt has been made to sketch in large outlines the salient features of humanistic education in its golden age of vigorous sincerity. To one after another of the nations of Europe, the Renaissance brought an enlarged view of life, of its meaning and opportunities, and a deepened sense of the possibilities and the supreme worth of personality. With this quickening of the inner life came humanistic learning to serve as nourishment and stimulus. But, as too frequently happens, that culture which was at first but a means to fuller life became in time supremely good for its own sake. Then follows an age when educational institutions—universities and higher schools—are given over to the mastery of ancient languages, the mere tools of thought; and emphasis falls rather upon sound grammatical knowledge and the attainment of a classic style than upon understanding and appreciation of the Greek and Roman solutions of the riddle of human life. Hence humanistic education, save for

²⁷ *Op. cit.*, p. 77.

²⁸ *Ibid.*, p. 270.

²⁹ *Ibid.*, pp. 296, 297.

the brilliant and favored few, becomes a lifeless study of ancient models with a view to an even more devitalized imitation. Educators work out logical methods of instruction in grammar and rhetoric with little regard to the unfolding minds which are somehow to assimilate this organized knowledge. The path once marked out and delimited by educational pioneers becomes more deeply worn with each passing generation. To write Latin prose and verse with some approximation to classic style, to gain a smattering, or something more, of the Greek language and literature, becomes the ideal of the educated world which had known the broad humanism of Vergerius and Erasmus. Methods and subject-matter alike become traditional and crystallized. While the great scientific movement goes on outside of all the established institutions of learning, little note is taken of its achievements by humanistic teachers who are in full possession of the educational field. In 1644, after Bacon had made his vigorous appeal for the substitution of an enlightened scientific method and subject matter for the lifeless material of the schools, Milton urged that all knowledge of science be gained through recourse to the classic authorities. And in this regard his was the general spirit of the time; even though the humanism of the poet was far more nearly akin to that of its earliest exponents than was the narrow linguistic study of his age.

But protestants against this circumscribed view of what it means to educate a man were not lacking, even so early as the sixteenth and seventeenth centuries. In the writings of François Rabelais, monk, physician, humanist and keen observer of men and affairs, we find an early plea for realism in education as opposed to the merely formal study of the classics. In his well-known "Life of Gargantua," overlaid as the thought is with extravagance and an almost boisterous humor, we catch glimpses of the author's insight into the value of scientific knowledge. Rabelais' princely giant is encouraged to observe the things and processes of nature as well as to master a vast and varied amount of classic learning suited to his enormous proportions. After his daily exercise in riding, fencing, wrestling and swimming, he returns with his tutor through the fields and is led to observe the trees, plants and forms of life about him. Moreover he is provided with all the "instruments requisite for herborizing" and daily brings home great handfuls of plants for analysis and classi-

fication. When it is full night he goes with his teacher to observe the heavens and to study "the figures, situations, oppositions and conjunctions" of the heavenly bodies. At dinner he is led to observe and discourse upon "the virtue, propriety, efficacy and nature of all that was served"; and if his observations are supplemented by the customary reference to the works of the ancients, their value is not lessened thereby. In characteristically extravagant fashion Rabelais voices his revolt against the barren formalism of the education of his day, while he urges a more liberalizing study of the classics and a far more exact and sympathetic observation of natural phenomena. "Now in the matter of the knowledge of the works of nature," writes Gargantua⁸⁰ to his son Pantagruel, "I would have thee to study that exactly; that so there be no sea, river nor fountain, of which thou dost not know the fishes; all the fowls of the air; all the several kinds of shrubs and trees, whether in forest or orchard; all the sorts of herbs and flowers that grow upon the ground; all the various metals that are hid within the bowels of the earth; together with all the diversity of precious stones that are to be seen in the orient and the south parts of the world."⁸¹ Truly a pretty, naturalistic program, and one that admirably reflects Rabelais' own sincere interest in the vast panorama of nature unfolding about him!

But Rabelais' protest falls upon deaf ears and upon minds wholly given up to the worship of ancient culture. A generation later Montaigne satirizes the barren scholarship of the period in his essay "Of Pedantry." True humanist as he is, he yet deplores the current tendency of that type of education "to stuff the memory, and leave the conscience and the understanding unfurnished and void."⁸² Sound learning, he urges, is not "for external show or ornament but to adorn and enrich (the) inward mind, desiring rather to shape and institute an able and sufficient man than a bare learned man." It is this ideal of the well-equipped man of affairs that dominates Montaigne's entire view of education. Although he concedes that Latin and Greek "are great ornaments in a gentleman," he does not hesitate to express his opinion that "they are purchased at too high a rate." For the youth who is to be an efficient member of the social world

⁸⁰ Cf. *Life of Gargantua* (Morle edy. 1887), pp. 74-82.

⁸¹ *The Heroic Deeds of Pantagruel*, op. cit., pp. 220, 221.

⁸² Op. cit. (Hazlitt ed.), pp. 154, 155.

of the sixteenth century must know both men and institutions at first hand, not alone through the writings of a bygone age.

"I would have this world's frame to be my scholar's choice book," he proclaims. Therefore only the first fifteen or sixteen years are "due unto pedantism, the rest unto action. . . ." Foreign travel, with a wise and discriminating tutor, not only informs young men regarding "the humors and fashions of those countries," but enables them the better to "know how to correct and prepare their wits by those of others." "In this school of commerce and society among men," the youth's education is to be continued until he learn to suppress "all manner of affection to undertake any action otherwise than for a public good and duty." In this statement is positive recognition of the inalienable relation of all sound education to the needs and purposes of human life.

The views of Montaigne struck a responsive chord here and there in the minds of certain men of social prominence who felt that linguistic study was not the ideal preparation for leaders in government and war. As the power and prestige of France enormously increased, as the national language grew into a beautiful and flexible medium of expression which became the court speech of polite Europe, as scientific knowledge and method developed apace, the attitude of the governing classes in France and Germany toward the narrow humanism of the schools underwent a profound modification. In Paris in the seventeenth century, the arts of architecture, painting and sculpture flourished, and the developing sciences were hospitably lodged in the new Academy which was destined to shed added lustre upon the court of Louis XIV. Frenchmen no longer shrank from a comparison of their brilliant civilization with that of the ancients; and in the sphere of science they felt their own age to have a distinct advantage. The science of Aristotle came to be held in low esteem by the seventeenth century devotees of a mathematical physics and mechanics; and the universities and schools which continued to teach an outgrown scientific knowledge fell under the ban of their contempt. In like fashion the court circles of France and Germany looked upon the round of instruction in Latin and Greek grammar and in composition in prose and verse as having lost all vital connection with the stirring life of the age. Among these courtiers a new conception of education

tended to replace the current one. The Renaissance ideal of the cavalier, versed in all chivalrous arts and accomplishments, and a master of the living languages of his own age, once more rose into prominence. In the words of a modern historian of education, such a courtier "cannot dispute on problems of scholastic philosophy and theology, but he is well versed in modern learning, i.e., natural sciences and mathematics, and he also knows something of modern political history, genealogy and geography."⁸⁸

The courtly Academies of France and the *Ritterakademien* of Germany were founded in response to this changed ideal. In 1640, Cardinal Richelieu established a typical French Academy in his native town. The Englishman, Evelyn, who visited it in 1644, thus describes its course: "To this towne belongs an Academy where besides the exercise of the horse, arms, dauncing, etc., all the sciences are taught in the vulgar French by Professors stipendiated by the great Cardinal. . . . " And again in a description of the Palais Cardinal in Paris he writes: "Here also young gentlemen are taught to fence, daunce, play on music, and something in fortification and the mathematics."⁸⁴ This last was a distinct concession to the needs of young men destined for military leadership. An English work on the education of the courtly gentleman, published in 1634, while urging the importance "of a good stile in speaking and writing, as well English as Latine," also advocates the study of "Cosmography," History and "Geometrie." The latter branch is favored for its use in surveying and building and above all for those who "follow the warres." For "you cannot without Geometrie fortifie your selfe, take the advantage of hill or levell, fight, order your Battallia in square, triangle, crosse, ... levell, and plant your Ordnance, undermine, raise your halfe Moones, Bulwarkes with many other meanes as of offence and defence, by fortification."⁸⁵ It is clear enough from this passage and from many writings similar in spirit, that the sciences, so far as they were encouraged in Academy and *Ritterakademie*, were valued solely as a means to the furtherance of highly practical human ends. The spirit of science for science's sake was confined to a small circle of kindred spirits,

⁸⁴ Paulsen, *German Education, Past and Present*, p. 103.

⁸⁵ Cf. Adamson, *Pioneers of Modern Education*, p. 178.

⁸⁶ Peacham's *Compleat Gentleman*, (ed. 1906), p. 77.

working in silence and with unflagging zeal in obscure nooks and corners throughout Europe.

Popular as were these new types of schools in courtly circles, the vast body of educational institutions was unaffected by them. The gymnasien of Germany, the Jesuit schools of France, the endowed Public Schools of England were all given over, heart and soul, to the making of young Romans, who could turn off a Latin epigram, write a Latin epistle or deliver a Latin oration in the approved style of Cicero. Bacon's plea for the dissemination of scientific knowledge and method, his attacks upon the verbiage of the schools, his arguments concerning the wholesomeness of intellectual doubt⁸⁶ and the supreme importance of the "art of inquiry or invention"⁸⁷ did, nevertheless, bear fruit in popularizing science among intelligent and reflective men. While he was not qualified to join the patient plodders in the field, yet by his brilliant and convincing rhetoric he won many adherents to his point of view and stirred up certain continental educators to attempt the application of his philosophy of knowledge to questions of educational subject-matter and method. Prominent among these was the Czech preacher and teacher, John Amos Comenius. Animated by the ideal of organizing an all-comprehensive system of knowledge in which each part should be seen in its relation to every other, Comenius yielded but a partial allegiance to the new philosophy of natural science. Yet he was in sympathy with the use of the inductive method when restricted to the investigation of natural phenomena. Thus he writes: "We need standards to which we may bring Things and dogmas concerning them, so that necessary truths may be readily separated from contingent, useful from useless, true from false. Such a standard the illustrious Verulam seems to have discovered for scrutinizing Nature, a certain ingenious induction, which is in truth an open road by which to penetrate into the hidden things of Nature." Yet he adds at once that the method is of small use to him in "building Pansophia," i.e. his scheme of organized knowledge, since "it is addressed solely to the revelation of Nature's secrets, whilst I look to the whole Scheme of Things

⁸⁶ *Advancement of Learning*, Bk. II, VIII, 5.

⁸⁷ *Ibid.*, XII, 3, XIII.

(*rerum universitas*.)”³⁸ Despite this modified faith in scientific method, Comenius was a sincere believer in the study of nature by methods “according to nature,” and was correspondingly opposed to the system of verbal education then in vogue. He sharply criticized the schools of his day because they pursued only intellectual progress and ignored both virtue and piety. Even in this pursuit they had achieved wretched results since “the intellect was scarcely ever nourished by the actual facts, but was filled with the husks of words, with a windy and parrot-like loquacity, and with the chaff of opinions.”³⁹ Yet the schools might be reformed if only sound principles of teaching and of learning could be found. “If we wish to find a remedy for the defects of nature,” he writes, “it is in nature herself that we must look for it, since it is certain that art can do nothing unless it imitate nature.”⁴⁰ So by a mistaken method of analogy with the processes of organic nature, Comenius works out with remarkable accuracy some of the present-day axioms of sound educational method.

With respect to the subject-matter of education, likewise, Comenius was out of sympathy with his age. He urges that if “we wish our schools to be truly Christian schools, the crowd of Pagan writers must be removed from them.” Yet this reformer recognized that, in an age when nearly all learned works were printed in Latin, and when that language was still the speech of international communication, youths must receive some instruction in it. Therefore, in the spirit of compromise, he wrote his famous text-books,—the “*Janua Linguarum*,” the “*Obis Pictus*,” and the rest,—seeking to combine an encyclopedic information of the *Realien*, or real things in the world of nature and of man, with an improved method of teaching Latin. An analysis of the “*Orbis Pictus*” makes it clear enough that Comenius was not concerned in this work with genuine scientific knowledge and method but rather with an all-embracing information which should begin with the attributes of God, lead by connected steps to simple facts concerning astronomy, geography, zoology, botany,

³⁸ Comenius, *Opera Didactica Omnia*, Part I, col. 432. Trans. in Adamson, *Pioneers of Modern Education*, p. 49.

³⁹ *Great Didactic*, Keatinge ed., pp. 78, 79.

⁴⁰ *Op. cit.*, p. 98.

human nature, the industries, government and destiny of man, and finally to the Last Judgment. This is not science but *Pan-sophia*. Yet Comenius, in his chapter on The Method of the Sciences,⁴¹ urges that "the commencement of knowledge must always come from the senses (for the understanding possesses nothing that it has not first derived from the senses)." He adds that science "increases in certainty in proportion as it depends on sensuous perception." But his fundamental thought regarding scientific studies is best summed up in the following words: "Whatever is taught should be taught as being of practical application in every-day life and of some definite use. That is to say, the pupil should understand that what he learns is not taken out of some Utopia or borrowed from Platonic ideas, but is one of the facts which surround us, and that a fitting acquaintance with it will be of great service in life."⁴²

Thus Comenius was the forerunner of those militant adherents of science who, two centuries later, forced the strongholds of humanism to open their doors to scientific studies. Yet he accomplished little, even in the introduction of the "real studies" into the schools. Generations passed before Germany awakened to the fact that she was overrating the ancient world at the expense of the present. Then, in the opening years of the eighteenth century, the Universities of Halle and Göttingen were transformed in method and aim and became the models for the reconstruction of all the universities of Germany. The spirit of modern science, the principle of freedom in teaching and in research, the decay of the ideal of original literary production in classic tongues, all marked the revolution in thought produced by the extension of scientific knowledge and method.⁴³ The secondary schools of Germany were slower to respond to changed conditions and needs. It was not until 1747 that Hecker established the first *Realschule* in Berlin. Here were taught not only Latin, French and German but history, geography, mathematics, mechanics, drawing and architecture as well as various industrial branches. The rise into power and influence of the trading and industrial classes in the larger towns and cities created a demand for schools

⁴¹ Op. cit., ch. XX.

⁴² Ibid, p. 189.

⁴³ Cf. Paulsen, *German Education, Past and Present*, pp. 116-124.

of this type and they speedily made their way into public favor. In all the commercial towns *Realschulen* of first and second rank were established during the nineteenth century to meet the needs of the commercial class and to prepare for the technical professions. It was not, however, until 1901 that to the highest of these schools,—the *Realgymnasium* and the *Ober-Realschule*—was accorded the privilege of sending their graduates to the University.

The last decades of the eighteenth century in Germany saw the rebirth of the early Renaissance ideal of classical study as unlocking the stores of beauty and wisdom in ancient culture to serve the needs of the present. The emphasis in this Neo-Humanism, however, fell rather upon Greek than upon Roman learning. The attempt was made to prove a spiritual relationship between the Greek and the German peoples, a relationship which was reflected in their intellectual development. The leaders of German thought earnestly sought for inspiration from the Greek spirit and genius to the end that their own literary productions might reflect the intellectual and moral grandeur of their prototypes. There followed a revolution in the classical study of the schools. Abandoning the slavish efforts at imitation of Latin models, educators turned enthusiastically to "Hellenic classicism." In the words of Paulsen: "The study of the classics now became a kind of cult, regeneration in its old theological sense being supplanted by the conversion to this enthusiastic embracing of all that was Hellenic, which was also looked upon as a new birth, but as a birth to true humanity."⁴⁴ Such a spiritual revival could not but delay the cordial recognition of the scientific branches as liberal studies.

It is noteworthy that the sciences first gained recognition because of their unquestionable usefulness in preparing for industrial, commercial and agricultural vocations. In the closing years of the eighteenth century the scientific studies were accorded some place in the curricula of secondary schools in France, owing largely to the influence of Talleyrand and Condorcet, but no facilities for specialization in science were afforded until 1847. After the French Expositions of 1855 and 1862; greater stress was laid upon scientific studies as a means of promoting the advancement of the national industries. For similar reasons, the

⁴⁴ Op. cit., p. 164.

Academies of America introduced the sciences in the first half of the nineteenth century. The first step in the introduction of natural science into the American Academies is seen in the emphasis laid on algebra and geometry. Then, one by one, astronomy, "natural philosophy," which included physics and chemistry, and geography were added. Even before the Revolution a few Academies, here and there, were teaching navigation and surveying.

It was in England, the stronghold of educational conservatism, that the scientific studies waged their hardest battle for recognition. In 1853 the Science division of the Department of Science and Art was created under the auspices of the Board of Trade, and the introduction of the teaching of science into secondary schools was urgently recommended. Subsidies were offered to any place establishing science classes on the results it could show in written examinations; and payments were made to teachers who had passed the special examination of the Department. After 1872 organized Science Schools were established which offered a course of scientific instruction covering three years. But in 1885, so tardy was the recognition of the pressing need of these schools, that only three had been organized.⁴⁵

Conditions in the endowed Public Schools were no better. The Report of the Royal Commission under Lord Clarendon, presented in 1864, stated that there was little systematic instruction in history and geography at any of the nine Great Public Schools, while natural science was almost entirely ignored. The Taunton Commission, appointed to investigate the education given in the remaining secondary schools of England, reported in 1867 that there was an almost total absence of scientific instruction within their walls, or, indeed, of any sort of instruction other than classical. Mr. Arthur Leach in his "History of Winchester College" describes, in vivid language, the character of the work done at Winchester in his own day (1863-1869). Wordsworth's "Greek Grammar" was used "which, by way of rendering *obscurius per obscurum*, was written in Latin. It remains to me to this day the ideal of all that is hideous and hateful in learning. Another nightmare was the production of 'vulguses,' or Latin epigrams on some given subject Three of these

⁴⁵ Cf. Balfour, *Educational Systems of Great Britain and Ireland*, p. 158.

hateful things had to be done a week In Junior Part⁴⁶ it was simple torture and very useless torture, when one had not the dimmest idea of the point of an epigram, and the haziest notions of Latin or quantities."⁴⁷ Also there were tasks in Latin prose and verse composition. "Throughout the whole three years spent in attaining Sixth Book, the English language, history and geography were an untouched region. Classics were the be-all and the end-all of our education."⁴⁸ French, indeed, was obligatory, but Mr. Leach describes the lessons in that subject as almost worthless largely because "French marks counted not at all with the classical marks towards settling our places in the school." "Science had been introduced under strong pressure from the Oxford University Commissioners of 1857." But the demands of this unwelcome study "were held to be satisfied from 1857 to 1862 by a course of ten lectures on Saturday afternoon. . . ." When the Public Schools Commissioners criticized this method of carrying out the ordinance of 1857, the Head Master "frankly told the Commissioners that instruction in physical sciences was, except for those who have a taste, and intended to pursue them as amateurs or professionally, practically worthless."⁴⁹ But the Warden of the School finally yielded so far as to compel all Scholars and Exhibitioners "to attend a science lecture once a week." The students never took these lectures seriously, and although there was an examination at the end of the term Mr. Leach characterizes it as "a pure farce."⁵⁰

It was such conditions as these that called out the scathing criticisms of Spencer and Huxley and precipitated a bitter conflict between the adherents of the humanities and the sciences. In his well-known treatise on "Education, Intellectual, Moral and Physical," Spencer inveighs against the "rude, undeveloped character" of English education and complains that "the comparative worths of different kinds of knowledge have been as yet scarcely even discussed—much less discussed in a methodic way with definite results."⁵¹ Clearly a measure of value of the rela-

⁴⁶ A "Part" was a division of one of the "Books" or Classes.

⁴⁷ Op. cit., p. 464.

⁴⁸ Ibid, p. 465.

⁴⁹ Ibid, p. 468.

⁵⁰ Ibid.

⁵¹ Ibid, p. 11.

tive values of different studies was the first requisite. And this Spencer furnishes in the following statement: "To prepare us for complete living is the function which education has to discharge; and the only rational mode of judging of any educational course is, to judge in what degree it discharges such function."⁸² The author then proceeds to classify, in the order of their importance, "the leading kinds of activity which constitute human life." These he finds to be the activities concerned in direct self-preservation, in acquiring a livelihood, in rearing offspring, in the maintenance of social and political relations, and finally the activities "which make up the leisure part of life, devoted to the gratification of the tastes and feelings."⁸³ In all the first four modes of activity Spencer shows that science is directly concerned. Health may be preserved and the life-span extended by the knowledge and application of the principles of physiology and hygiene. The "production, preparation and distribution of commodities," in which nearly all classes are employed, is completely dependent on science in some of its departments. And the loss from want of this scientific knowledge is frequent and great. The ignorance of parents concerning the laws of physical, intellectual and moral growth has entailed enormous suffering and loss of power upon their offspring. Finally "all social phenomena are phenomena of life and can be understood only when the laws of life are understood." Thus science lies at the basis of the most important human activities and "concerns all mankind for all time." Yet, indignantly concludes the author, this "vital knowledge by which we have grown as a nation to what we are and which now underlies our whole existence, is a knowledge that has got itself taught in nooks and corners; while the ordained agencies for teaching have been mumbling little else but dead formulas."⁸⁴ It might be inferred from this exaltation of science that Spencer ignores the uplifting influences of literature and art which he relegates to the leisure hours of life and education. But he seeks to reassure us on this point. For when education and science have been so systematized that "a preparation for the more essential activities may be made

⁸² Op. cit., p. 16.

⁸³ Ibid, p. 18.

⁸⁴ Ibid, p. 44.

with comparative rapidity then will the poetry, both of Art and Nature rightly fill a large space in the minds of all."⁵⁵ Whether minds nourished upon so exclusively scientific a regimen would develop much appreciation for beauty in literature, art or nature was a question which troubled Spencer not at all.

As lecturer, essayist and member of the London School Board, Thomas Huxley exerted an influence in favor of scientific education even more potent than that of Spencer. In his splendid essay on "A Liberal Education" he compares human life to a game of chess. "The chess-board is the world, the pieces are the phenomena of the universe, the rules of the game are what we call the laws of Nature. The player on the other side is hidden from us. We know that his play is always fair, just and patient. But also we know to our cost that he never overlooks a mistake, or makes the smallest allowance for ignorance."⁵⁶ Education consists in "learning the rules of this mighty game." Hence Huxley defines education as "the instruction of the intellect in the laws of Nature, under which name (he includes) not merely things and their forces, but men and their ways; and the fashioning of the affections and of the will into an earnest and loving desire to move in harmony with those laws."⁵⁷ And such an education, he maintains, is truly liberalizing; for an individual so instructed "is, as completely as a man can be, in harmony with Nature. He will make the best of her, and she of him. They will get on together rarely; she as his ever beneficent mother; he as her mouth-piece, her conscious self, her minister and interpreter."⁵⁸

In the essay on "Science and Culture" Huxley criticizes the humanists of the nineteenth century who "take their stand upon classical education as the sole avenue to culture, as firmly as if we were still in the age of the Renaissance." "Yet surely," he urges, "the present intellectual relations of the modern and the ancient worlds are profoundly different from those which obtained three centuries ago."⁵⁹ Our age has a distinctive character which "lies in the vast and constantly increasing part which is played by natural knowledge. Not only is our daily life shaped by it, not only does the prosperity of millions of men depend upon it,

⁵⁵ *Op. cit.*, p. 65.

⁵⁶ Cf. Huxley's *Science and Education*, p. 82.

⁵⁷ *Op. cit.*, p. 83.

⁵⁸ *Ibid.*, p. 86.

⁵⁹ *Ibid.*, pp. 94-95.

but our whole theory of life has long been influenced, consciously or unconsciously, by the general conceptions of the universe, which have been forced upon us by physical science."⁶⁰ This scientific criticism of life appeals not to authority but to nature. Yet, continues Huxley, the "purely classical education advocated by the representatives of the Humanists in our day, gives no inkling of all this Scholarly and pious persons, worthy of all respect, favor us with allocutions upon the sadness of the antagonism of science to their mediaeval way of thinking, which betray an ignorance of the first principles of scientific investigation, an incapacity for understanding what a man of science means by veracity, and an unconsciousness of the weight of established scientific truths, which is almost comical."⁶¹ Yet Huxley is far too liberal to question the importance of the humanities in education. Indeed he says, "An exclusively scientific training will bring about a mental twist as surely as an exclusively literary training." Nevertheless, he has only condemnation for "the ordinary smattering of Latin and Greek" as preparation for those who mean to make science their calling or who must enter early upon the business of life.

After these brilliant and effective sorties into the camp of the enemy, the battle between the sciences and the humanities was fairly under way. The adherents of humanistic education urged the importance of Greek to clergymen, of Latin to lawyers and scholars. Driven further to defend the usefulness of the knowledge they presented, they claimed that the classics were the best introduction to the study of philology, furnished the soundest instruction in the general principles of grammar, and were indispensable to a thorough knowledge of English and other modern languages as well as the literatures in those tongues. The moral and aesthetic influence of the ancient literatures was further insisted upon as rendering them of paramount worth as educational material. Finally the value of linguistic study as a training of the mental faculties was descanted upon with great seriousness. These educators, blameless, in most instances, of any scientific knowledge of psychology, tended to regard the mind as a sort of storage-house for holding the different kinds

⁶⁰ *Op. cit.*, p. 149.
⁶¹ *Ibid.*, pp. 150, 151.

of mental power, accumulated in the study of Latin and Greek, and giving them out at the will of the owner.

Perhaps one of the most earnest and able pleas for humanistic study was made by Matthew Arnold in his essay on "Literature and Science." Like a true humanist Arnold asserts that the goal of education is "to know ourselves and the world." and, as a means to this end "to know the best which has been thought and said in the world."⁸² He reverts to Huxley's criticism that a purely classical education gives no inkling of nature as the expression of a definite order and no knowledge of the most important facts of life. "But," replies Arnold, "I would include in literature knowledge of great scientific discoveries and methods." "There is therefore really no question between Professor Huxley and me as to whether knowing the great results of the modern scientific study of nature is not required as a part of our culture, as well as knowing the products of literature and art."⁸³ Arnold is even ready to admit that "in natural science the habit gained of dealing with facts is a most valuable discipline, and that everyone should have some experience of it."⁸⁴ But he differs sharply from those educators who would give to science the chief place in education, on the ground that they leave out of account the constitution of human nature. In Arnold's view human nature is made rich and strong by "the power of conduct, the power of intellect and knowledge, the power of beauty and the power of social life and manners."⁸⁵ These are not isolated powers; rather in most of us there is a tendency to relate them one to another. Our instinct for knowledge leads us to acquire portions of truth which we are impelled to relate to our sense for conduct and our sense for beauty. In this desire lies the strength of the hold of letters upon us. Now some kinds of knowledge cannot be made directly to serve this instinct. These are the so-called "instrument knowledges" in which the specialist delights. As examples Arnold cites mathematics, Greek accents and formal logic. But he concedes that natural sciences do not stand on the same footing as these, since their facts and results are intrinsically interesting to most men.

⁸² Discourses in America, p. 95.

⁸³ Op. cit., p. 95.

⁸⁴ Ibid, p. 99.

Ibid, p. 101.

Yet when some scientific fact is propounded to us "we are still in the sphere of intellect and knowledge." The majority of men will experience "an invincible desire to relate this proposition to the sense in us for conduct and to the sense in us for beauty."⁶⁶ But this, Arnold contends, the men of science consistently refuse to do. They give us only pieces of knowledge and finally, perhaps, general concepts of the universe. But these still remain *knowledge* unrelated to conduct and to beauty and therefore "after a certain while, unsatisfying, unvarying." If, as Huxley maintains, the conceptions of science are to prove fatal to the beliefs of our forefathers, "the need of humane letters to establish a relation between the new conceptions and our instinct for beauty, our instinct for conduct, is only the more visible."⁶⁷ How the humanities will accomplish this relation Arnold does not know. But he is confident that if letters lose their leading place for a time we "shall be brought back to them by our wants and aspirations."

In the decade between 1860 and 1870 the educational warfare between naturalists and humanists waxed hottest. Sharp criticisms were bandied back and forth. The humanists accused their opponents of being grossly utilitarian in point of view and incapable of appreciating the finer things of the spirit. The naturalists retorted by challenging the statements of their adversaries as to the cultural results of their narrow humanistic régime. Granting that some boys of strong literary bent passed with moderate success through the traditional classical courses, they contended that with the greater number the case was reversed. For the mind, being exhausted with the initial labors of mastering grammar and imitating stylistic effects, imbibed little indeed of the inspiration and thought of the literature. Moreover, the system of verse-making in Latin and Greek was characterized as a "demonstrable absurdity." "Regarded as an end it is confessedly insignificant; regarded as a means, it is notoriously unsuccessful," writes Dean Farrar.⁶⁸ In scathing language he describes the agonized and unintelligent efforts of English school-boys to fill out pentameters with the "particular epithet, which presents the requisite combination of longs and shorts," or,

⁶⁶ Op. cit., p. 111.

⁶⁷ Ibid, p. 117.

⁶⁸ Cf. *Essays on a Liberal Education*, p. 209.

still worse, to write so-called "originals." "What wonder," he exclaims, "that many bright and promising boys, whose abilities do not lie in this direction, are either crushed under this worse than Egyptian bondage, or require the entire fortitude of their best principles of honour to abstain from using such means of deliverance as lie most easily within their reach."⁶⁹

Here and there, however, might be found an individual who regretted this battle of educators as unnecessary and sought a basis of compromise. In a remarkably sane and impartial essay concerning "The Theory of Classical Education" Mr. Henry Sidgwick deplores the disastrous error committed by certain educational reformers "in allowing the notion to become current, that there is a sort of antagonism between science and literature, that they are presented as alternative instruments of education, between which a choice has to be made." It is so evident (he continues) "that if one or the other must be abandoned, if we must inevitably remain either comparatively ignorant of the external world, or comparatively ignorant of the products of the human mind, all but a few exceptional natures must choose that study which best fits them for communion with their fellow-men." To this a critic might be permitted to object that when the accomplishments of science for the well-being and progress of mankind have been duly considered, this judgment might conceivably be reversed. But Mr. Sidgwick absolutely denies the incompatibility of science and literature and maintains that the notion would never have occurred to anyone except for the illusion that the only literary education of any value is the classical with the emphasis on linguistic exercises. Now that the miserable results of this type of education were at last driven home to the minds of "simple-minded" English gentry, it is not strange, he feels, that "instead of demanding more literature as well as more science, they cry for less literature."⁷⁰ Let us rather demand, says the author, that "all boys, whatever be their bent or destination, be really taught literature" as well as the methods and subject matter of science.

In a similar spirit John Stuart Mill wrote his Inaugural Address delivered to the University of St. Andrews in 1867.

⁶⁹ *Op. cit.*, p. 215.

⁷⁰ *Essays on a Liberal Education*, pp. 128, 129.

"This question," he rather humorously asserts, "whether we should be taught the classics or the sciences, seems to me, I confess, very like a dispute whether painters should cultivate drawing or colouring, or, to use a more homely illustration, whether a tailor should make coats or trousers. I can only reply by the question, why not both? Can anything deserve the name of education which does not include literature and science too? If there were no more to be said than that scientific education teaches us to think and literary education to express our thoughts, do we not require both? And is not anyone a poor, maimed, lop-sided fragment of humanity who is deficient in either? We are not obliged to ask ourselves whether it is more important to know the languages or the sciences. Short as life is, and shorter still as we make it by the time we waste , we are not so badly off that our scholars need be ignorant of the laws and properties of the world they live in, or our scientific men destitute of poetic feeling and artistic cultivation. I am amazed at the limited conception which many educational reformers have formed to themselves of a human being's power of acquisition. The study of science, they truly say, is indispensable; our present education neglects it ; and they think it impossible to find room for the studies which they desire to encourage, but by turning out, at least from general education, those which are now chiefly cultivated. How absurd, they say, that the whole of boyhood should be taken up in acquiring an imperfect knowledge of two dead languages. Absurd indeed; but is the human mind's capacity to learn, measured by that of Eton and Westminster to teach? I should prefer to see these reformers pointing their attacks against the shameful inefficiency of the schools, public and private, which pretend to teach these two languages and do not."¹¹

And in a short time the position of Mill became the conviction of educational reformers throughout England. As a result of the unfavorable report made by the Clarendon Commission, concerning the meagre curriculum and results in the nine leading endowed schools, the Public Schools Act was passed in 1868. By the provisions of the act these schools were required to make new statutes which should embody reforms in both administration

¹¹ *Op. cit.*, pp. 12, 13.

and instruction. Since that time the sciences have been admitted, grudgingly enough at first, to some degree of recognition. But although scientific branches are now accorded something like their rightful place, the endowed secondary schools throughout England are still strongly humanistic in sympathy. Little by little, however, science everywhere has claimed its own, until in the public secondary schools of France, Germany, England and America it holds honored place in all courses of study. During the latter half of the nineteenth century the enormous development of technical schools and schools of pure and applied science throughout most of the leading countries of the world, bears witness to the widespread conviction that science is the chief support of an industrial society. In America, at least, the once all powerful humanities have been reduced to a somewhat humble and apologetic rôle. Now and again reflective men sound a warning against the merely scientific and utilitarian tendency of the age. They urge that a too exclusive interest in the facts of science without interpretation, or in specialized vocational pursuits will inevitably contract the mental horizon and destroy the graciousness and light of true culture. Already the question is raised whether our science, in secondary schools and colleges, is not too colorless and abstract to take hold of the experience of the growing youth. A recent writer has urged that there surely must lie "a realm of sound teachable sciences, a chemistry, a physics, a physiology, that relates itself to and interprets the student's experience, and, wherever and whenever possible, touches fearlessly his prospective activity."¹ Such a scientific instruction would have a broad human interest and bearing, even while it preserved due regard for exact method and knowledge.

Clearly, then, the sciences and the humanities have signed no lasting truce, nor are they laboring together in the spirit of mutual coöperation. Too often they are set in opposition to each other, as if the sciences were remote from the life of man while the humanities dealt only with human problems and interests to the exclusion of all reference to nature. This unfortunate antithesis has its roots in a philosophy of nature and of man which is strongly dualistic in character. It should be the task of a sound educational philosophy to abolish this opposition and to show

¹ Mr. Abraham Flexner, in the *Atlantic Monthly* for June, 1909

the intimate relation between the life activities of human beings and the forces of nature which are responsible for them. From this point of view, man's life loses continuity and a point of attachment if not rooted deep in natural processes and laws. Moreover the study of nature becomes a formal, lifeless thing if it exclude all reference to the multiform interests and activities of society. As a result of this division in thought, the study of the humanities tends to produce the man of culture in the sense of the polished man, more widely acquainted with the thoughts and achievements of generations past than with the forces at work in his own age; while the pursuit of the sciences too frequently develops the narrow technician or specialist lacking in breadth of human interest and knowledge.

In the closing chapter of this study, the attempt will be made to present a philosophy of nature and man which will eliminate the dualism so prevalent in educational thought, and will make possible a reconciliation of the attitudes of naturalist and humanist. If this much-to-be-desired end is ever accomplished, it will result in harmonizing the discordant elements of our present-day curriculum and in bringing about a higher degree of unity in the aim and method of education.

CHAPTER VI

THE PRAGMATIC SOLUTION OF THE PROBLEMS OF NATURALISM AND HUMANISM

Present-day writers have frequently commented upon the marked indisposition of the age to go beyond the confines of experience in its search for truth and reality. During the last century the triumphant progress of science has reorganized economic life, transformed political relations and profoundly altered the point of view from which man surveys his world. Equipped with a tool of method which has been refined and sharpened by the experience of three centuries, and justified abundantly by its fruits, science has won for itself an honorable place in the Parliament of knowledge and is returned by an ever-growing body of constituents to represent progressively larger and more complex interests. *Pari passu* with the dissemination of scientific knowledge and procedure has gone the gradual and silent transformation of man's attitude toward the true and the real. Metaphysics has slowly yielded ground to physics and biology until its once imperial domain has been reduced to a petty state. The respect for facts which are drawn from experience, guaranteed by experience and ultimately referred back to experience for its more satisfactory control, is a widespread feeling. And this regard for intra-experiential truth is fostered by the favorable results to which it leads. In every sphere of existence to which the spirit and method of science have been applied, the returns in exact, verifiable knowledge and in increased control have been generous if not wholly satisfying. Such demonstrable knowledge and beneficent outcomes are so many pegs on which the present generation hangs its faith in the remedial influence of intelligence when applied to brute things and forces. In proportion as this faith has become dominant, the tendency to employ purely speculative and transcendent notions in the explication of the riddle of the universe has perceptibly weakened, until at present it is discredited not

alone of science but of a growing body of philosophers. And this distaste seems rooted in the conviction that whatever transcends immediate experience or cannot be shown to form part of a future possible experience has no bearing upon the interests and concerns of human life and may therefore be neglected with entire impunity.

But science has wrought a further change in man's conception of the true and the real. Physics and chemistry, astronomy and geology all have contributed their share to the idea of a world in continuous flux, in process of transformation into novel forms. Change, progressive movement, expressing itself through the medium of material things, seems to be the primary datum of reality. And now that the theory of evolution has shed its light into the dark corners of biology, psychology and the social sciences, we have come more and more to think of nature in terms of energy, variation, struggle and adaptation. The study of organic structure and function reveals always the same pregnant fact: vital impulse is the fundamental term in the organic world, and this force, itself the product of physical and chemical energies, makes use of material organs as its instruments in the everlasting struggle for satisfactory adjustment to variable environing conditions. Life, to be sure, is not all of the reality which nature encompasses but it is that aspect with which man must of necessity be most intimately concerned. And this form of natural energy alone exhibits at the stage of human life the capacity for intelligent and many-sided adaptation to a transitional environment.

Such considerations as these, which are continually being driven home to reflective minds by the conclusions of science and the teachings of experience, have borne fruit in the elaboration of that modern philosophy of reality and knowledge called pragmatism. That this latest explanation of the meaning of thought and things has an unsavory odor in the nostrils of philosophers of the older schools cannot be denied. It is a mushroom growth, having no claim to consideration on the grounds of hoary age and respectability. Moreover it is dangerously radical, cutting under the fundamental supports of ancient philosophies in order to lay a new groundwork. For the idealist and the realist alike have conceived of reality as a ready-made and independent thing which it is the function of knowledge to represent with what

faithfulness it may. To the idealist reality appears as spiritual throughout, being indeed the subjective and objective aspects of the experience of an Absolute, conceived as summing up within itself all being, all truth, all value, to all eternity. To the realist, on the contrary, reality is material, as expressed in an independent external world of things and forces which he infers from his own perceptual states. Thus both these theories of existence are brought face to face with the problem of knowledge. Why, if reality is complete in itself, should man struggle to produce his imperfect copies? Why, if the Absolute embraces the totality of existence and worth, should it elect to express itself in a finite world of cramping restrictions, and through the medium of human intelligence which is so impotent to reproduce it? These are the queries addressed with increasing emphasis to the idealistic camp. And a similar difficulty confronts the realist. Why should it be the function of knowledge to reduplicate existing things? In the language of Professor James: "Theoretic truth, truth of passive copying, sought in the sole interests of copying as such, not because copying is *good for something*, but because copying ought *schlechthin* to be, seems, if you look at it coldly, to be an almost preposterous ideal. Why should the universe, existing in itself, also exist in copies?"¹ Moreover is not such a theory of knowledge wholly out of accord with the scientific view of reality as dynamic and progressive? Now, just here, pragmatism comes to the rescue and offers a theory of existence and truth that seems to sever this Gordian knot at one stroke.

And what is the solution presented by this much contemned philosophy? First and foremost pragmatism resolutely refuses to regard the external world of objects and their relations as a complete, self-contained reality which is the bearer of truth. To the pragmatist truth does not take up its external abode in objects but is the precious product of the interaction of thought and things. Objective existence, from this view point, is in constant process of transformation and readjustment and knowledge is one most important means of effecting beneficent changes in reality itself. It is a little difficult to see why such a position should arouse the storm of protest which has been directed against it. Surely most people will not deny that the knowing

¹The Meaning of Truth, p. 96.

process has a natural history, set forth in the validated conclusions of biology and psychology. This history traces for us the genesis and development of the brain as that organ in the whole organic structure whose peculiar function it is to effect favorable reactions in all cases where the issue is doubtful and where intelligence may intervene to disentangle the web of circumstances. But who will say that the results thus accomplished by the act of knowing are confined solely to the organism? The brute fact of steam as hot vapor was long familiar to mankind. But when the *meaning* of steam—its enormous expansive energy—was worked out by thought in some situation of tension, the face of reality underwent a change. A thousand appliances were developed for harnessing natural things to serve human designs. Not only the economic life but the physical environment of man was gradually transformed. This seems obvious enough. But the statement that knowledge is a process by which reality reveals itself as teleological, as concerned in its own betterment, goes deeper than this. Whatever his ultimate destiny may be, man's life is rooted deep in cosmic and biologic forces. Thus the function of cognition in the interests of more satisfactory adjustment is, as Professor Dewey has pointed out, no merely personal and psychological thing;² it is biologic and cosmic as well. Moreover the knowing act introduces a new content into reality. For without the reacting organism, such distinctions as large, heavy, edible, good, painful, would never have been made; and the meanings thrown out at haphazard by nature in its process of change would never have been caught up and crystallized in permanent and useful modes of reaction. For to discover that a natural product is heavy or edible or painful is to alter our entire behaviour toward it in virtue of this added meaning given to reality.

The pragmatist's view of nature, then, contrasts sharply with the various theories held by naturalists and humanists in the long course of history. Since the Renaissance, all these philosophers, as I have attempted imperfectly to show, have agreed in regarding nature as a finished and static product, independent in its make-up of the consciousness that knows it. It is true that Hegel conceives of nature as the outward manifestation of the Absolute

² See article on Reality as Practical in *Essays Philosophical and Psychological in Honor of William James*, p. 65.

which is engaged in a progressive realization of its own most perfect and comprehensive being through the medium of things and institutions. But Hegel does not for a moment conceive of the appearance of a wholly novel product in the world. Everything is contained from the beginning in the all-embracing existence of the Absolute and is bound to appear in due course of time. And among the naturalistic philosophers, prior to Darwin, the conception of nature as a complete system of material things and forces which it is the function of mind to reproduce in as perfect a photograph as possible was almost universal. Comte's insistence upon an obedient subjection to nature as the first step in "positive" knowledge contains no hint that in this subordination to things man is other than a passive beholder and reproducer. To the pragmatist, on the contrary, nature and hence reality is in very truth in process of making. Thus with one courageous breath he blows away the mists of ancient problems concerning the existence of evil and the possibility and nature of knowledge. Objects are a part of existence to be sure, and where it is to the advantage of the organism to copy them with exactness, copied they surely are. But it is not brute things *as they exist previous to the knowledge relation* that he posits as his basic principle. Rather is it the natural process itself using crude existence as its material and rising to consciousness of its own meanings and values in human life. From this aspect, at least, regardless of all its cruel blunders and wanton waste, nature is capable of intelligent purpose.

The place of man in the scheme of Nature has already been suggested. He alone, of all her multifarious progeny, is in league with herself in the elucidation of practical meanings from what were else mere change. From this vantage-point truth appears as dynamic and progressive in character. Like reality it is in process of making. The "truth" of pragmatism is thus no ready-made, static and impotent thing but is incarnate in living experience, deriving from this source its original impulse and returning to it for its final authorization. Once sanctioned by experience, truth becomes an instrument for its effective control. Truth, then, is identical with tested knowledge, i.e., knowledge which has been repeatedly verified and has immediately or ultimately effected advantageous changes in experience. To the charge of its opponents that pragmatism identifies the satisfactory with the

true, it may be replied that this satisfying character of truth applies not alone to the inner attitudes and feelings of the subject, but to the whole external situation to which that truth is relevant. In other words truth must "square" not only with experience in its personal aspect but with experience in its broader objective phases. And it must prove its worth not once but "in the long run." It is clear that such a conception of truth affords generous opportunity for the reconstruction of long-accepted doctrines in the light furnished by changing conditions. Moreover it should serve to remind intelligent beings of their responsibility to preserve and foster that attitude of inquiry and of open-mindedness to fresh truth, so vitally involved in all progress. Upon man as the bearer of valid knowledge devolves, also, the tremendous responsibility of exercising his intelligence in such wise as to produce results of pure and abiding value. For his judgments of truth and his appraisals of worth are not mere acts of knowing performed in lofty isolation from things and events. Rather do they represent the attitudes, the tendencies to action, of a living organism brought into vital contact with concrete situations. Even where the original impetus to thought is ideal rather than sensuous, the links in the chain binding that idea to experienceable realities are not far to seek. And ultimately, if the conclusion to which the idea leads us is valid, this truth will justify itself in our behavior and effect some satisfactory change in reality itself. Such a reconstruction need not be overt to be practical. Changes in attitude, in point of view, in purpose, are no less real than those transformations of brute things that knowledge has rendered possible.

But what are the distinguishing marks of the knowledge situation? Clearly, if the above account be sound, knowing cannot consist in mere consciousness of objects as present. This is crude sensation, or refined perception, but it is not cognition. By means of this mental act alone, it is obvious that no addition can be made either to knowledge or to reality, and no beneficent results can accrue to mankind. No more does that form of "knowledge" which we employ in the habitual acts of daily life fulfill all the requirements of the knowing function. To dress ourselves doubtless once demanded a considerable degree of conscious attention and intelligent direction of our movement by their foreseen consequences. The same holds good of all

occupations calling for "trained skill." But our reactions in the presence of these stimuli have largely ceased to be consciously directed and have become habitual or even mechanical. Yet may it not be possible, as Professor Dewey has suggested,⁸ that the clue to the whole problem of knowledge may be found here? As an organism whose continued existence depends upon acquaintance with things and with successful modes of reaction to them, is it not probable that man first acquired knowledge in the struggle to act efficaciously in response to concrete stimuli? Such responsive acts, once successfully performed, would the more easily be reproduced, and would tend to become habitual. Given the proper cue the act would follow with a minimum of conscious attention. But this proposition implies its converse. If knowledge, as ingrained habit, no longer makes large demands upon consciousness, it may be inferred that consciousness is required only in circumstances to which the individual is unaccustomed. If the elements in this situation were sufficiently novel it might well happen that old habits of adjustment would prove inadequate. A condition of tension would thus be set up; the activity as stimulus would find no corresponding activities of response. Then would be felt the need of consciousness or, what is the same thing, of attention directed toward the unfamiliar factors in the total situation with a view to ascertaining their meaning. In such a state of strain produced by imperfect functioning, recourse would be made to past knowledge for guidance in interpreting the present and forecasting the future.

But how is this possible? Indeed the problem is a knotty one if ideas be looked upon as special and imperfect copies of thoughts in the mind of the Absolute or even as faithful reproductions of material things neatly stored away in the memory. But fortunately these two modes of explanation do not exhaust the possibilities of the case. For if we keep close to the fundamental position of pragmatism, which asserts that experience is the ultimate term of reality, we shall be led to consider the ideas themselves as capitalized experience to be drawn upon in case of need. Every stimulus pouring in upon the organism not only results in a relevant response but receives added meaning through

⁸ In unpublished lectures on the Philosophy of Education, delivered in Columbia University in the year 1909-10.

that response. In other words crude sensations provoke random or instinctive reactions, which return again upon the stimulus endowing it with meaning; thus these sensations are transformed into percepts. In like manner perceptions of things, serving themselves as spurs to more complex reactions, receive, through the responses they excite, a rich addition in terms of meaning and value. To the pragmatist ideas *are* these meanings, regarded as organic attitudes of response, tendencies to act in a specific way when confronted with doubtful situations where old habits of reaction are inadequate. It is under such conditions of unsatisfactory functioning that experience breaks up into fact and idea; and when harmony is restored the distinction no longer exists. Thus ideas are "standardized experience" woven into the nervous structure of the organism and capable of being reinstated during occasions of stress to throw light upon the present difficulty and to point to future consequences. When Copernicus became convinced that the old Ptolemaic habits of thinking would no longer explain the phenomena of the solar system, a long period of doubt and strain ensued during which he called upon a variety of ideas, representing the meaning of past experiences, to assist in the solution of the problem. At last there dawned upon his mind the conception that the apparent motion of bodies is always relative to the position of the beholder and to his state of motion or rest. Doubtless Copernicus had noted the fact that in the case of rapidly moving vehicles, the trees and objects by the roadside appear to move in an opposite direction from the traveller. This idea promptly proved its worth in shedding meaning upon the tangled situation and in pointing to certain consequences which would follow upon its acceptance as a working hypothesis. For it became clear to Copernicus that if the "watcher of the skies" could transfer himself from the earth into the abyss of space the apparent motions of the heavenly bodies might quite possibly be reversed, and the earth be discovered to be in rapid motion about the sun.⁴

Ideas, then, are instruments in the satisfactory control of the flux of experience. As the outcome, in the form of meaning, of past situations of tension, they are not static impressions but modes of reaction, plans of behavior. And the same holds good

⁴ Cf. Dewey, *The Reflex Arc Concept*, *Psy. Rev.*, III, 357.

of perceptions as well. Surely we do not go about the world looking at things for the mere sake of storing our minds with impressions of objects. We observe, note qualities and powers, when it serves our purpose so to do; when, in other words, the observation of things in detail will assist in removing some obstruction to effective thinking or acting. Thus a moving object on a dark street at night will arouse attention just because we do not know what it is, i.e., how to react to it. Stimulus and response are not coördinated, and until this coördination is accomplished there must ensue a period of perplexity and strain.

Thus biology and psychology alike seem to support the position of pragmatism that experience is the common denominator of existence and that the favorable maintenance of life is the sole function of all the bodily and mental powers of man. Truth appears as a fair structure reared by human hands and capable of reconstruction from time to time in response to the need of its builders. And this fact should be cause, not for dismay, but for a sober joy. If truth were eternally bound up with objective existence, what would be the function of intelligence save to reproduce irrevocably that completed truth characterized by so much of evil, so much of unsatisfactoriness? But if truth be a man-made thing, the product of thought in its struggle with mutable existence, it has illimitable capacities for growth and transformation in the interests of human life.

This brief and incomplete exposition of the theory of pragmatism has perhaps suggested to the reader that this philosophy by no means breaks completely with the world-views of the humanist and the naturalist. To the humanistic philosopher, who reads the whole universe in terms of purpose, value and ultimate end—all borrowed from the purely human aspect of existence—the pragmatist would say: By what right do you abstract one phase of reality to serve as the norm for the complex whole? Are there not vast regions of existence unknown to man to which his human categories may have no application? Moreover why introduce an unknown factor—the Absolute—as a principle of explanation of reality? Does not science justify us in regarding experience as self-contained and self-explanatory? Yet *within the sphere of the human* the concepts of end, meaning, value have profound significance. So far as man is able to subdue brute nature to his enlightened will, so far he is justified in regarding

that nature as teleological. For it sanctions the meanings he extracts from events and proves itself amenable to the ends they suggest.

To the naturalist, on the other hand, pragmatism might discourse as follows. Granted that nature is a mechanism and man the product of mechanical energies, what significance has the term "mechanism" apart from some intelligence to which it serves as a principle of explanation and guidance? Nature might have gone on forever, blindly working out her sequences of events, had she not given birth to a being capable of estimating their meaning and worth in terms of his own welfare. Every concept of science is a tool in the service of the theoretic or the practical interests of mankind. Moreover, while it is conceded that even the inner life of man operates according to mechanical laws, as determined by heredity and environment, this is by no means to subscribe to pure determinism. For although his capacities for thought, emotion and achievement have their limits set by natural law, no man knows his own limits; and within them his estimates of value and his choices may be profoundly influenced by intelligent reflection upon the meaning and outcome of his acts. Only the hopeless imbecile is a *mere* mechanism, responding without thought to the myriad stimuli of his surroundings. Thus in the enlightened will of man lies his ultimate hope of social and moral advancement.

But what is the bearing of pragmatism upon education and in particular upon the problem of the relative value of the sciences and the humanities? First let us consider very briefly its contributions to educational philosophy in general. Obviously enough, a theory of knowledge which lays such marked stress upon active experience as the condition of the knowing activity will attach great importance to the conception of education as just such vital experiencing. Only when our educational institutions reproduce as nearly as may be those life-conditions which challenge thought by presenting to it novel and problematic situations, can knowledge capable of functioning in the guidance of life be acquired and applied. Our instruction deals too much with spectral abstractions, too little with warm realities. Hence our students frequently do not perceive that this second-hand knowledge, so logically presented, once had its birth in experience and leads back into it. To turn our school-rooms into places

where ample opportunity is furnished for direct experience with things as well as ideas and with the efficient working out of the problems they suggest; and to make plain the bearing of all knowledge upon human life in its physical, social or moral aspects,—this is to educate. } For under such conditions the individual is gaining insight into the meaning and complexity of nature and of social life at the same time that he is growing in power to apply his knowledge to the solution of the difficulties they present. Educational institutions of whatever grade should be forging-houses of experience, not purveyors of a logically arranged, pre-digested material of experience. Knowledge cannot be digested vicariously for any individual. If it is to become part of the bone and sinew of his intellectual and moral life, it must "catch hold" of that life,—it must show its credentials to recognition as a product of the struggle, the coöperative effort, the enlightenment, the aspiration, that go into the making of social experience, and hence of the experience of every individual as a member of society. Without doubt there may be short cuts to experience, and it is here that the knowledge of past ages, snugly stored away in books, may be of profound service to the present and coming generations. But it has been wisely said that "books are a bloodless substitute for life"; and until the conditions for a vivid, intimate experiencing are present, in the form of concrete situations making demands on brain and hand, the wisdom in those storehouses too frequently misses its mark or makes but a superficial impression. Hence the widespread lamentation over the educational waste in our present system,—its tremendous expenditure and proportionately meagre returns.

Let us turn now to the specific problem with which this whole discussion is concerned—the relation of the sciences and the humanities as material for education. The tendency to regard these subjects as unrelated, if not opposed, goes back to the beginnings of modern science, and its history has been traced in the preceding chapter. { One branch of recorded experience grows out of man's desire to select and appreciate the worthier and more enduring values of human life. The other originates in his desire to subjugate his environment, to penetrate its hidden secrets that he may make it minister to the wants of human life. } But these are not antagonistic, for each sends its roots deep into the common soil of social experience, the one to grasp the higher

meanings and worths of that experience, the other to provide the material substratum, based upon knowledge and control of natural processes, without which the former could not exist. The history of science is the history of man's attempt, not alone to adapt himself to his surroundings, but to shape his environment to serve his developing needs. Nature, then, is intimately bound up with the social life of mankind; for from this bountiful source man draws the materials and the dynamic energies which make present civilization possible, nay, which enter into its very structure. The history of thought seems to make plain that true literature, which has passed beyond the stage of a mere record of traditions and is designed to stir the emotions and quicken the imagination to sensitive appreciation of the finer values of human experience, is not born until man has gained such control of the fundamental processes of nature as to guarantee reasonable security and comfort in social living. Then, when nature has been taken up into human life, and has greatly widened and enriched it, man turns a reflective eye upon various aspects of his broadened experience and perceives these in terms of moral and aesthetic worth. Eras of great national expansion are grounded in changed economic conditions and these in turn are determined by man's success in bending nature to his will. This natural foundation once firmly laid, a fair superstructure of literature and art may well be added. When Greece had learned how to control environing conditions, when she had spelled out part of the riddle of sky and sea and earth in their relation to human well-being, when economic and social life had been enormously expanded thereby, then followed a great spiritual awakening. All the old, accepted, customary values of life were subjected to searching criticism and to ultimate revision or rejection. And the literature of the period, like all great and enduring thought, was a reflection of the national life, stirred to its very depths. History records the same truths of the spiritual Renaissance of the fifteenth century and of England's great literary awakening in the sixteenth.

Why, then, since the humanities and the sciences are both outgrowths of social experience, and the perfection of the one is so rooted in the wholesome development of the other, are they set in such unfriendly juxtaposition in present-day education? The answer, I believe, is twofold. In the first place, when

one aspect of human experience has been marked off for particular attention and development, its investigation tends to produce special attitudes and methods in its devotees. As time goes on, the vital and original connection of the subject with social life tends to become obscured and finally almost to disappear. The knowledge is transformed from a means to an end judged good in itself. Such is the educational history of both sciences and humanities. Each in turn became detached from living experience to serve as means for education. At first, the humanities, as we have seen, did not ignore their true origin and function but subordinated themselves right willingly to the enrichment and control of life. But the bond of union between social life and the literary material of education grew tenuous enough in the progress of the years. A special technique for acquiring proficiency in Latin prose and verse composition loomed large in the educational horizon for nearly three centuries; and [the true function of the humanities in the clarifying of social values sank out of sight.] Technical skill in the manipulation of the tools of literature thus became the goal of education and the subject in consequence became more and more isolated from the growing national life. The sciences, likewise, ever since their tardy introduction into the curricula of the schools, have shown a marked tendency to emphasize knowledge of facts and laws and control of scientific methods rather than to make plain to the student the vital relation between science and social life. As a result the study of this important branch of knowledge too frequently becomes dry and lifeless, appealing only to the intellect of the few endowed with a taste for formal facts and principles and with some ability to make their own applications to living experience. The hopeless ineffectiveness of many high school and college girls when confronted with required work in physics and chemistry is a well-known educational fact. If, however, these dreaded subjects were humanized, were given their rightful place in relation to the maintenance and continuous development of social life, their abstractness and difficulty would largely disappear. Why should not the principles of physics be approached through a study of the tools and appliances by which economics and social life are maintained and kept smoothly running? Would the facts and laws be less or more clearly comprehended by such procedure? And would there not be a

suffusion of the whole subject with worth and meaning as soon as its vital human bearing was made plain? No subject gains in clearness and definiteness by being too soon and too sharply severed from all those connections which serve to bring its salient features into clear relief.

[The true bond of union between sciences and humanities, then, is found in their common relationship to the warm, breathing, dynamic life of the community. Cut them off from that source of nourishment and they not only develop antagonism between themselves but fail of their true purpose in the clarification and uplifting of human life.] The study of the humanities, by reason of its isolation from either past or present experience, has tended to produce the cultured man of refined taste and feelings but with little true appreciation of the depth and beauty of every-day human life in its tensions and mistakes and aspirations toward better things. Too frequently such so-called men of culture are out of sympathy and active touch with the political, social and moral problems of their own day and generation, problems which cry aloud for the solution that only the man of social insight and trained efficiency can discover. The recent Report of the English Commission on moral training in the Public Schools of England⁵ revealed clearly that the Head-Masters of those schools keenly realize the aloofness of many of their graduates from the active life of village or town wherein their ancestral homes are placed. Even problems of national scope and broad human interest fail to stir many of these young men whose school-days have been devoted to the humanities! And the isolation of the sciences from social experience has no better result. The student too often becomes absorbed in mere facts and their relations and in questions of exact technique to the exclusion of all knowledge or appreciation of the connection of science, since its earliest beginnings with the evolution of civilization. Such methods train the intellect in a narrow way at the expense of the social and moral nature. And so the "cultivated" humanist eyes with disfavor the mere scientist or technician who warmly reciprocates his disapproval; and neither has learned the true meaning of "culture." For, no matter

⁵ Moral Instruction and Training in Schools; Report of an International Enquiry, Book II, ch. XII.

what path the man elects to follow, be it science or literature, industry or art, he has reached the goal of a sound and genuine culture only when his growth in knowledge and efficiency has been accompanied by a broadening of his human outlook and a deepening of his capacity for human insight and sympathy.

The twofold cause of the opposition of humanities and sciences seems to lie, then, in their too early and complete severance from their source in social life and in the consequent individualistic type of education they furnish. We proclaim and urge that the socialized and moralized character is the supreme end of education. Yet we continue to mark off all the subjects to which we introduce the child from his experience as a social being and from the vital connection with each other which their common relation to that experience would supply. We do this in the vain hope that these precious deposits of meanings and values which have been collected in the long course of social living can be transmitted to the undeveloped child without the intervention of any active experience of his own. Over and over again Professor Dewey has pointed out this fallacy and has shown the educational world how it may be avoided.⁶ Only when our schools become places where social experience,—coöperative effort in the solution of common problems and the realization of common ends,—is made possible can we hope to find each subject assuming its proper connection with that vital experience and shedding its quota of light on the meaning and worth of human life. Our boys and girls can be socialized only in a social environment. They can be made moral as well as intelligent not by mastery of detached facts but by comprehension of each body of knowledge in its relation to the well-being of society and by training in the active use of that knowledge in the solution of the social and moral problems of the school and the playground. A genuine experiencing of each branch of study in its relation to a developing life must therefore precede all sharp differentiation of subject-matter into number, science, literature and the rest. When these studies have emerged from experience and have been clearly recognized in their own peculiar bearing upon it, their demarcation for special study may be made increasingly definite. The theoretic interest develops earlier in some children than in

⁶ Cf. his *School and Society* and *The Child and the Curriculum*.

others and such minds may advantageously pursue differentiated branches of study before other minds are ready for the work. Which statement may be inferred to mean that our schools must be adapted in grading and classification to growing minds, not the converse which holds to-day. Yet, even in high school and college, all subjects should be approached from the standpoint of human experience and present-day civilization if their true meaning is not to be lost in details of knowledge and procedure.

But, it may be urged, this is an age of specialization and students must be fitted for highly specialized fields of knowledge and employment. This is true. But detailed research in facts and methods, valuable as it is, cannot be allowed to precede broad and sympathetic acquaintance with human life in its many-sided variety. To educate the mere scholar, the mere scientist, is to fall short of the goal which society has come to perceive as supremely good. The priceless fruits of civilization can hardly be preserved, much less augmented, unless our educational institutions concern themselves actively, not alone in the manufacture of trained specialists but in the development of men and women with a broad range of social interests made effective through social sympathy and social efficiency. And this most precious flower of culture may be attained by humanist and naturalist alike; by him whose chief interest is in discovering the true values of social life, and by him who seeks more fully to understand and control those natural materials and energies upon which all wholesome and progressive social experience is dependent. Each, while choosing his own path, may recognize with ungrudging admiration the worth of the quest upon which the other has set forth, and its vital function in the progressive development and ennobling of human life.

BIBLIOGRAPHY

SOURCES

- ARISTOTLE.** *Metaphysics.* Translated from the Greek by Rev. J. H. M' MAHON. London, 1896.
- Politics.* Translated by B. Jowett. Oxford, 1885.
- Nichomachean Ethics.* Translated with an analysis and critical notes by J. E. C. WELLDON. London, 1906.
- BACON, FRANCIS.** *The Novum Organum or A True Guide to the Interpretation of Nature.* Oxford University Press, 1855.
- The New Atlantis.* Cassell's National Library. London, 1886.
- Advancement of Learning.* Oxford, 1885.
- CAMPANELLA, TOMMASO.** *The City of the Sun.* In *Ideal Commonwealths*, Morley's Universal Library. London, 1889.
- CASTIGLIONE, COUNT BALDESAR.** *The Book of the Courtier.* Translated and annotated by L. E. Opdycke. New York, 1901.
- COMENIUS, JOHN AMOS.** *Great Didactic.* Keatinge edition. London 1896.
- COMTE, AUGUSTE.** *Positive Philosophy.* Translated by H. MARTINEAU. London, 1896.
- Système de Politique Positive.* 4 vols. Paris, 1851-54.
- CONDILLAC, ÉTIENNE B.** *Œuvres Complètes.* Paris, 1798.
- Essai sur L' Origine des Connaissances Humaines.* Vol. I.
- Traité des sensations.* Vol. II.
- CONDORCET, MARIE JEAN.** *Esquisse d' un tableau historique des progrès de l' esprit humain.* Paris, 1822.
- DANTE, ALIGHIERI.** *The Banquet (Il Convito).* Translated by KATHERINE HILLARD. London, 1839.
- DARWIN, CHARLES.** *The Origin of Species.* London, 1902.
- DESCARTES, RENÉ.** *Discourse on Method.* Open Court Publishing Co., Chicago, 1903.
- Meditations on the First Philosophy.* Open Court Publishing Co., Chicago, 1903.
- The World, or Essay on Light.*
- Tract on Man.*
- [In *The Philosophy of Descartes* in *Extracts from his Writings.* Torrey edition, New York, 1892.]
- DWEY, JOHN.** *Studies in Logical Theory.* University of Chicago Press, 1903.
- Reality as Practical; in Essays Philosophical and Psychological in honor of Mr. James.* London, 1908.

- DEWEY, JOHN. What does Pragmatism mean by Practical? *Journal of Philosophy and Psychology*, Vol. V, No. 4. 1908.
 The Significance of the Problem of Knowledge. University of Chicago Contributions to Philosophy. 1897.
 The Reflex Arc Concept. *Psychological Review*, Vol. III, 1898, pp. 357-370.
 The School and Society. Chicago, 1899.
 The Child and the Curriculum. Chicago University Contributions to Education, 1902.
- DIDEROT, DENIS. Œuvres Complètes. Tome Deuxième. Paris, 1875.
 Entretien entre D' Alembert et Diderot.
 De L' Interpretation de la Nature.
- D' HOLBACH, BARON. Système de la Nature. Paris, 1821.
- ELYOT, SIR THOMAS. The Boke named the Governour. Edited from first edition of 1531 by Henry H. S. Croft. London, 1883.
- ERASMUS, DESIDERIUS. On the Method of Study. Translated in Woodward's Erasmus. Cambridge, 1904.
 De Pueris Instituendis. In Woodward as above.
- FAIRBANKS, ARTHUR. First Philosophers of Greece; an edition and translation of the remaining fragments of the pre-Socratic philosophers. New York, 1898.
- FICHTE, JOHANN G. Grundlage der gesammten Wissenschaftslehre. Bonn, 1834.
- GOETHE, JOHANN W. Sämmtliche Werke; Vol. I. Stuttgart, 1881.
- GUARINO, B. De Ordine Docendi et Studendi. Translated by Woodward in Vittorino da Feltre. Cambridge, 1897.
- HEGEL, WILHELM F. Encyclopädie der philosophischen Wissenschaften im Grundrisse. Leiden, 1906.
- HELVÉTIUS, CLAUDE ADRIEN. De L' Esprit. Paris, 1845.
- HOBBS, THOMAS. Leviathan. Cambridge University Press, 1904.
 The Metaphysical System of Hobbes. Selections edited by MARY W. CALKINS. Open Court Publishing Co., 1905.
- HUME, DAVID. Enquiry concerning the Human Understanding. Oxford, 1894.
- HUXLEY, THOMAS H. Science and Education. New York and London, 1893.
- JAMES, WILLIAM. Pragmatism; a new name for some old ways of thinking. New York, 1907.
 The Meaning of Truth. New York and London, 1909.
- KANT, IMMANUEL. Critique of Pure Reason. Max Müller edition, London, 1881.
 Critique of Practical Reason.
 Critique of the Judgment.
 [In Watson's edition of extracts. New York, 1892.]
- LA METTRIE, JULIUS D. Der Mensch eine Maschine. Leipzig, 1879.
- LEIBNIZ, GOTTFRIED W. Œuvres Philosophiques. Paris, 1900.
 Nouveaux Essais. Vol. I, pp. 1-497.

- LEIBNIZ, GOTTFRIED W. *Monadologie*. Vol. I, pp. 707-722.
Principes de la Nature et de la Grace. Vol. I, pp. 723-731.
- LOCKE, JOHN. *Essay concerning the Human Understanding*. Oxford, Clarendon Press, 1894.
- Two Treatises on Civil Government. Morley's Universal Library. London, 1887.
- MACHIAVELLI, NICCOLÒ. *The Prince*. Morley's Universal Library. London, 1889.
- MILL, J. S. *Inaugural Address delivered to the University of St. Andrew's*. London, 1867.
- Essay on Nature*; in *Three Essays on Religion*. New York, 1874.
- MONTAIGNE, MICHEL DE. *Essays*. Hazlitt edition, London, 1877.
- PEACHAM's Compleat Gentleman. From the edition of 1634. Oxford, 1906.
- PLATO. *Dialogues*. Translated by B. JOWETT. Oxford.
- RABELAIS, FRANÇOIS. *Life of Gargantua and the Heroic Deeds of Pantagruel*. Morley's Universal Library. London, 1887.
- ROUSSEAU, JEAN JACQUES. *Discours qui a remporté le prix à l'Académie de Dijon*. Genève, 1750.
Discours sur l'origine et les fondamens de l'inégalité parmi les hommes. Amsterdam, 1755.
Social Contract; or *Principles of Political Right*. Tozer edition, London, 1895.
Émile; or *Treatise on Education*. Payne edition, New York, 1893.
Julia; or *The new Eloisa*. Edinburgh, 1794.
- SCHELLING, F. W. J. *Sämmtliche Werke*. Stuttgart, 1859.
Ideen zu Einer Philosophie der Natur. Vol. II.
Über den wahren Begriff den Naturphilosophie. Vol. IV.
Entwurf eines Systems der Naturphilosophie. Vol. IV.
- SCHOPENHAUER, ARTHUR. *Über den Willen in der Natur*. *Schriften zur Naturphilosophie und zur Ethik*. Leipzig, 1877.
- SPENCER, HERBERT. *Essays Scientific, Political and Speculative*. New York, 1899.
First Principles. New York, 1900.
Principles of Biology. New York, 1883.
Principles of Psychology. New York, 1899.
Principles of Sociology. New York, 1883-1897.
Principles of Ethics. New York, 1892-1893.
- VOLTAIRE. *Œuvres Complètes*. Vols. IV, XVII-XX. Paris, 1879.
- VERGERIUS, PAULUS. *De Ingeniis Moribus*. Translated in WOODWARD's *Vittorino da Feltre*. Cambridge, 1897.
- WHITCOMB, MERRICK. *Source Book of the Renaissance in Italy and Germany*. Philadelphia, 1899-1900.

SECONDARY WORKS

- ADAMSON, J. W. *Pioneers of Modern Education*. Cambridge, 1905.
- ARNOLD, MATTHEW. *Literature and Science; in Discourses in America*. London and New York, 1889.

- BALFOUR, GRAHAM. *The Educational Systems of Great Britain and Ireland.* Oxford, 1903.
- BENN, A. W. *The Greek Philosophers.* 2 vols. London, 1882.
The Philosophy of Greece. London, 1898.
- BOURTRoux, ÉMILE. *Descartes and Cartesianism.* Cambridge Modern History, Vol. IV.
- BURCKHARDT, JACOB. *Civilization of the Renaissance in Italy.* London, 1890.
- CAIRD, EDW. *The Critical Philosophy of Immanuel Kant.* 2 vols. Glasgow, 1889.
The Social Philosophy of Comte. Glasgow, 1893.
- CAIRD, REV. JOHN. *An Introduction to the Philosophy of Religion.* Glasgow, 1894.
- FARRAR, REV. F. W. (editor). *Essays on a Liberal Education.* London, 1867.
- FRANCKE, KUNO. *A History of German Literature as determined by Social Forces.* New York, 1905.
- FULLER, B. A. G. *The Theory of God in Book A of Aristotle's Metaphysics.* *Philosophical Review*, Vol. XVI, pp. 170-183.
- GODWIN WILLIAM. *Enquiry concerning Political Justice and its Influence on Morals and Happiness.* London, 1798.
- GRAY, ASA. *Darwiniana.* New York, 1876.
- HÖFFDING, DR. HAROLD. *A History of Modern Philosophy.* Translated by B. E. MEYER. 2 vols. London, 1900.
- JEBB, SIR RICHARD C. *Humanism in Education.* London, 1899.
- JOHNSON, EDITH H. *The Argument of Aristotle's Metaphysics.* Dissertation in Faculty of Philosophy, Columbia University, 1906.
- LANGE, FR. A. *History of Materialism.* Boston, 1881.
- LÉVY-BRUHL, LUCIEN. *History of Modern Philosophy in France.* Open Court Publishing Co., Chicago, 1899.
Essay on Descartes; in Descartes Meditations etc. Open Court Publishing Co., 1901.
- LUPTON, J. *Life of John Colet.* London, 1887.
- MAC VANNEL, J. A. *The Educational Theories of Herbart and Froebel.* Teachers College, Columbia University. *Contri. to Education*, No. 4.
- MACKINTOSH ROBERT. *From Comte to Benjamin Kidd.* New York, 1899.
- MALTHUS, T. R. *Essay on the Principles of Population; or a View of its past and present Effect on Human Happiness.* 2 vols. London, 1806.
- MORLEY, JOHN. *Rousseau.* 2 vols. London, 1888.
Diderot and the French Encyclopaedists. London, 1905.
Voltaire. London, 1906.
- MYERS, CHAS. S. *Naturalism and Idealism.* *Philosophical Review*, Vol. X, 1901.
- NICHOL, JOHN. *Francis Bacon: his Life and Philosophy.* 2 vols. Edinburgh and London, 1888.

